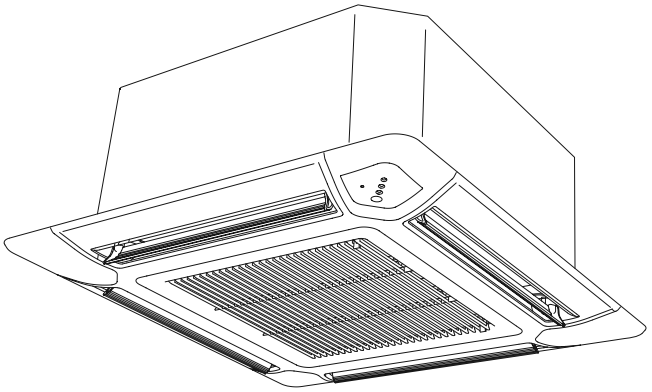
AIR CONDITIONER
INDOOR UNIT
Compact Cassette Type

INSTALLATION MANUAL



INSTALLATION MANUAL
For authorized service personnel only.
English

INSTALLATIONSANLEITUNG
Nur für autorisiertes Personal.
Deutsch

MANUEL D'INSTALLATION
Pour le personnel agréé uniquement.
Français

MANUAL DE INSTALACIÓN
Solo para personal autorizado.
Español

MANUALE D'INSTALLAZIONE
Ad uso esclusivo del personale autorizzato.
Italiano

ΕΓΧΕΙΡΙΔΙΟ ΕΓΚΑΤΑΣΤΑΣΗΣ
Για εξουσιοδοτημένο προσωπικό σέρβις.
Ελληνικά

MANUAL DE INSTALAÇÃO
Apenas para técnicos autorizados.
Português

РУКОВОДСТВО ПО УСТАНОВКЕ
Для уполномоченного персонала.
Русский

KURULUM KILAVUZU
Yetkili servis personeli içindir.
Türkçe

PART NO. 9379124010-05

INSTALLATION MANUAL

PART No. 9379124010-05
INDOOR UNIT (Compact Cassette Type)

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1. SAFETY PRECAUTIONS

- Be sure to read this Manual thoroughly before installation.
- The warnings and precautions indicated in this Manual contain important information pertaining to your safety. Be sure to observe them.
- Hand this Manual, together with the Operating Manual, to the customer. Request the customer to keep them on hand for future use, such as for relocating or repairing the unit.

⚠ WARNING	This mark indicates procedures which, if improperly performed, might lead to the death or serious injury of the user.

Request your dealer or a professional installer to install the indoor unit in accordance with this Installation Manual. An improperly installed unit can cause serious accidents such as water leakage, electric shock, or fire. If the indoor unit is installed in disregard of the instructions in the Installation Manual, it will void the manufacturer's warranty.

Do not turn ON the power until all work has been completed. Turning ON the power before the work is completed can cause serious accidents such as electric shock or fire.

If refrigerant leaks while work is being carried out, ventilate the area. If the refrigerant comes in contact with a flame, it produces a toxic gas.

Installation work must be performed in accordance with national wiring standards by authorized personnel only.

⚠ CAUTION	This mark indicates procedures which, if improperly performed, might possibly result in personal harm to the user, or damage to property.

Read carefully all security information before use or install the air conditioner.

Do not attempt to install the air conditioner or a part of the air conditioner by yourself.

This unit must be installed by qualified personnel with a capacity certificate for handling refrigerant fluids. Refer to regulation and laws in use on installation place.

The installation must be carried out in compliance with regulations in force in the place of installation and the installation instructions of the manufacturer.

This unit is part of a set constituting an air conditioner. It must not be installed alone or with non-authorized by the manufacturer.

Always use a separate power supply line protected by a circuit breaker opera-ting on all wires with a distance between contact of 3mm for this unit.

The unit must be correctly earthed (grounded) and the supply line must be equipped with a differential breaker in order to protect the persons.

The units are not explosion proof and therefore should not be installed in explosive atmosphere.

Never touch electrical components immediately after the power supply has been turned off. Electric shock may occur. After turning off the power, always wait 5 minutes before touching electrical components.

This unit contains no user-serviceable parts. Always consult authorized service personnel to repairs.

When moving, consult authorized service personnel for disconnection and installation of the unit.

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.

2. ABOUT THE UNIT

2.1. Precautions for using R410A refrigerant

⚠ WARNING

Do not introduce any substance other than the prescribed refrigerant into the refrigeration cycle. If air enters the refrigeration cycle, the pressure in the refrigeration cycle will become abnormally high and cause the piping to rupture.

If there is a refrigerant leak, make sure that it does not exceed the concentration limit. If a refrigerant leak exceeds the concentration limit, it can lead to accidents such as oxygen starvation.

Do not touch refrigerant that has leaked from the refrigerant pipe connections or other area. Touching the refrigerant directly can cause frostbite.

If a refrigerant leak occurs during operation, immediately vacate the premises and thoroughly ventilate the area. If the refrigerant comes in contact with a flame, it produces a toxic gas.

2.2. Special tool for R410A

⚠ WARNING

To install a unit that uses R410A refrigerant, use dedicated tools and piping materials that have been manufactured specifically for R410A use. Because the pressure of R410A refrigerant is approximately 1.6 times higher than the R22, failure to use dedicated piping material or improper installation can cause rupture or injury. Furthermore, it can cause serious accidents such as water leakage, electric shock, or fire.

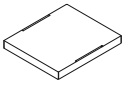
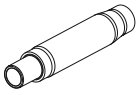
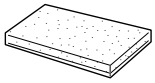
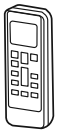
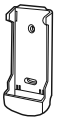
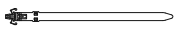
Tool name	Changes
Gauge manifold	The pressure in the refrigerant system is extremely high and cannot be measured with a conventional gauge. To prevent erroneous mixing of other refrigerants, the diameter of each port has been changed. It is recommended to use a gauge manifold with a high pressure display range of –0.1 to 5.3 MPa and a low pressure display range of –0.1 to 3.8 MPa.
Charging hose	To increase pressure resistance, the hose material and base size were changed. (The charging port thread diameter for R410A is 1/2 UNF 20 threads per inch.)
Vacuum pump	A conventional vacuum pump can be used by installing a vacuum pump adapter. Be sure that the pump oil does not back flow into the system. Use one capable for vacuum suction of –100.7 kPa (5 Torr, –755 mmHg).
Gas leakage detector	Special gas leakage detector for R410A refrigerant.

2.3. Accessories

⚠ WARNING

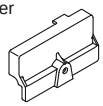
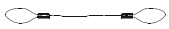
For installation purposes, be sure to use the parts supplied by the manufacturer or other prescribed parts.
The use of non-prescribed parts can cause serious accidents such as the unit to fall, water leakage, electric shock, or fire.

- The following installation parts are furnished. Use them as required.
- Keep the Installation Manual in a safe place and do not discard any other accessories until the installation work has been completed.

Name and Shape	Q'ty	Description
Operating Manual	1	
Installation Manual	1	(This book)
Coupler heat insulation (Large)	1	For indoor side pipe joint (Gas pipe)
Coupler heat insulation (Small)	1	For indoor side pipe joint (Liquid pipe)
Special nut A (Large flange)	4	For installing indoor unit
Special nut B (Small flange)	4	For installing indoor unit
Template (Carton top) 	1	For ceiling openings cutting Also used as packing
Drain hose 	1	For installing drain pipe VP25 (O.D.32, I.D.25)
Hose Band	1	For installing drain hose
Drain hose insulation 	1	For installing drain pipe
Remote controller 	1	For air conditioner operation
Battery	2	For remote controller unit
Remote controller holder 	1	For installing the remote controller
Tapping screw (M3 × 12mm)	2	For mounting the remote controller holder
Cable-tie	2	For electrical wiring
Wire clamper 	1	For electrical wiring

(*1) This part is not furnished for AUT* series

2.4. Cassette grille accessories

Name and Shape	Q'ty	Description
Connector cover 	1	For covering connector
Tapping Screw (M5 × 12 mm)	4	For mounting cassette grille
Tapping Screw (M4 × 12 mm)	1	For mounting connector cover
L angle	2	For mounting the Hook Wire to the Cassette grille
Hook wire 	2	For suspending the Cassette grille
Screw [pitch small] (M4 × 10 mm)	2	For mounting the Hook Wire (for metals)
Screw [pitch large] (M4 × 10 mm)	4	For mounting the L angle and Hook wire (for resins)

2.5. Optional parts

Parts name	Model No.	Summary
Wired remote controller	UTY-RNN*M	Unit control is performed by wired remote controller
Simple Remote Controller	UTY-RSN*M	For air conditioner operation
Air outlet shutter plate	UTR-YDZB	Install the plate at outlet when carrying out 3-way direction operation
Insulation kit for High humidity	UTZ-KXGC	
External connect kit	UTY-XWZX	For control input/output port
Fresh air intake kit	UTZ-VXAA	To take fresh air

Wired remote controller is recommended using simultaneous twin or triple connection.

3. INSTALLATION WORK

Especially, the installation place is very important for the split type air conditioner because it is very difficult to move from place to place after the first installation.

3.1. Selecting an installation location

Decide the mounting position together with the customer as follows.

⚠ WARNING

Select installation locations that can properly support the weight of the indoor unit. Install the units securely so that they do not topple or fall.

⚠ CAUTION

Do not install the indoor unit in the following areas:
- Area with high salt content, such as at the seaside. It will deteriorate metal parts, causing the parts to fail or the unit to leak water.
- Area filled with mineral oil or containing a large amount of splashed oil or steam, such as a kitchen. It will deteriorate plastic parts, causing the parts to fail or the unit to leak water.
- Area that generates substances that adversely affect the equipment, such as sulfuric gas, chlorine gas, acid, or alkali. It will cause the copper pipes and brazed joints to corrode, which can cause refrigerant leakage.
- Area that can cause combustible gas to leak, contains suspended carbon fibers or flammable dust, or volatile inflammables such as paint thinner or gasoline. If gas leaks and settles around the unit, it can cause a fire.
- Area where animals may urinate on the unit or ammonia may be generated.

Do not install where there is the danger of combustible gas leakage.

Do not install the unit near a source of heat, steam, or flammable gas.

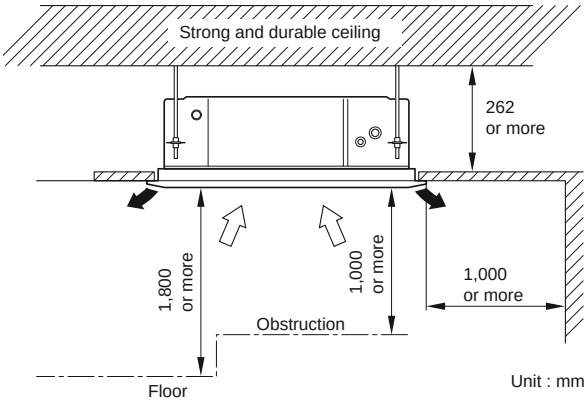
Install the indoor unit, outdoor unit, power supply cable, transmission cable, and remote control cable at least 1 m away from a television or radio receivers. The purpose of this is to prevent TV reception interference or radio noise. (Even if they are installed more than 1 m apart, you could still receive noise under some signal conditions.)

If children under 10 years old may approach the unit, take preventive measures so that they cannot reach the unit.

(1) Install the indoor unit in a location having sufficient strength to support the weight of the indoor unit.
(2) The inlet and outlet ports should not be obstructed; the air should be able to blow all over the room.
(3) Leave the space required to service the air conditioner.
(4) Locate where the air can be distributed evenly throughout the room by the unit.
(5) Install the unit where connection to the outdoor unit is easy.
(6) Install the unit where the connection pipe can be easily installed.
(7) Install the unit where the drain pipe can be easily installed.
(8) Install the unit where noise and vibration is not amplified.
(9) Take servicing, etc., into consideration and leave the spaces. Also install the unit where the filter can be removed.

3.2. Installation dimension

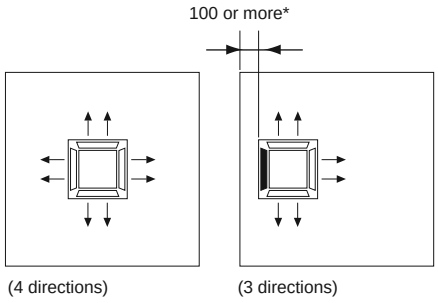
• The ceiling rear height as shown in the figure.



Unit : mm

• This product can be installed at a height of up to 3,000mm.
However, 7000, 9000 Btu/h model can not be installed in high places.
Perform the Function Setting on the remote control in accordance with the installed height. (See 8.2.Function setting)

Discharge direction setting
• The discharge direction can be selected as shown below.



Unit : mm

• For a 3-way outlet, make sure to perform the Function Setting on the remote control. Also, make sure to use the optional shutter plate to block the outlet.

• The ceiling height cannot be set in the 3-way outlet mode. Therefore, do not change the setting in the setting the ceiling height. (See **8.2. FUNCTION SETTING**)

• When the outlet is shut, be sure to install the optional Air outlet shutter plate kit.
For the details of installation, please refer to Installation Manual of kit.

3.3. Installation the unit

⚠ WARNING

Install the air conditioner in a location which can withstand a load of at least 5 times the weight of the main unit and which will not amplify sound or vibration. If the installation location is not strong enough, the indoor unit may fall and cause injuries.

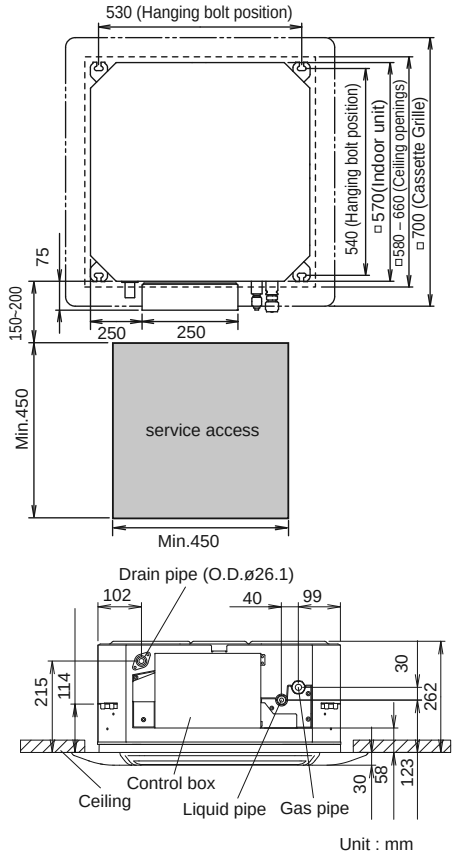
If the job is done with the panel frame only, there is a risk that the unit will come loose. Please take care.

3.3.1. Position the ceiling hole and hanging bolts

Ceiling openings and hanging bolt installation diagram.

⚠ WARNING

When fastening the hangers, make the bolt positions uniform.



Unit : mm

Be sure to keep sufficient space in the designated position for future maintenance.

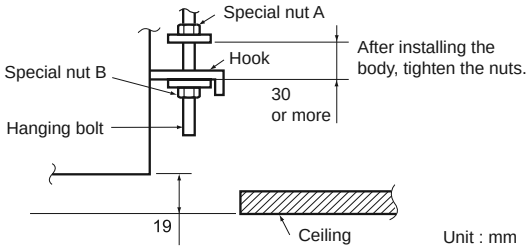
3.3.2. Body installation

(1) Install special nut A, then special nut B onto the hanging bolt.
(2) Raise the body and mount its hooks onto the hanging bolt between the special nuts.
(3)Turn special nut B to adjust the height of the body.

⚠ WARNING

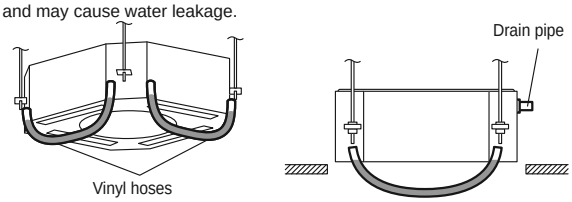
Perform final tightening by tightening the double nut firmly.

Be sure to install the body horizontally and adjust the height below the body and the ceiling surface properly.



3.3.3. Leveling

Using a level, or vinyl hose filled with water, fine adjust so that the body is level.
Inclined installation so as the drain pipe side is higher may cause a malfunction of the float switch, and may cause water leakage.



3.3.4. Installing drain pipe

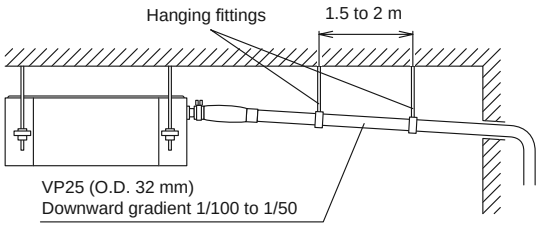
⚠ WARNING
Do not insert the drain piping into the sewer where sulfurous gas occurs. (Heat exchange erosion may occur)
Insulate the parts properly so that water will not drip from the connection parts.
Check for proper drainage after installation by using the visible portion of transparent drain port and the drain piping final outlet on the body.

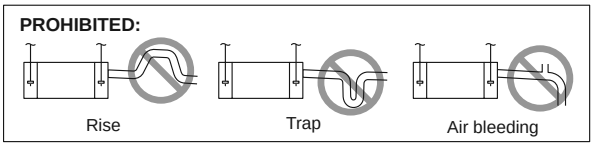
⚠ CAUTION
Do not apply adhesive agent on the drain port of the body. (Use the attached drain hose assembly to connect the drain piping)

Note: Install the drain pipe.

- Install the drain pipe with downward gradient (1/50 to 1/100) and so there are no rises or traps in the pipe.
- Use general hard polyvinyl chloride pipe (VP25) [outside diameter 32mm] and connect it with adhesive (polyvinyl chloride) so that there is no leakage.
- When the pipe is long, install supporters.
- Do not perform air bleeding.
- Always heat insulate indoor section of drain pipe.
- If it is impossible to have sufficient gradient of pipe, perform drain lift-up.

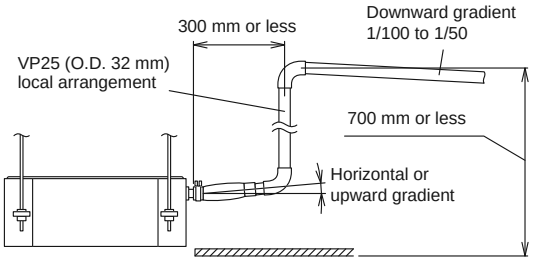
	Pipe size
Drain pipe	VP25 (O.D. 32 mm)

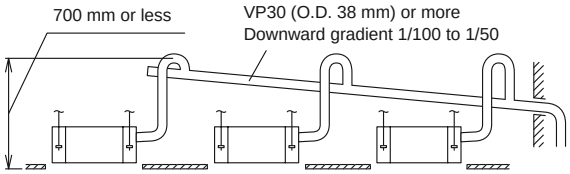




When lifting up drain:

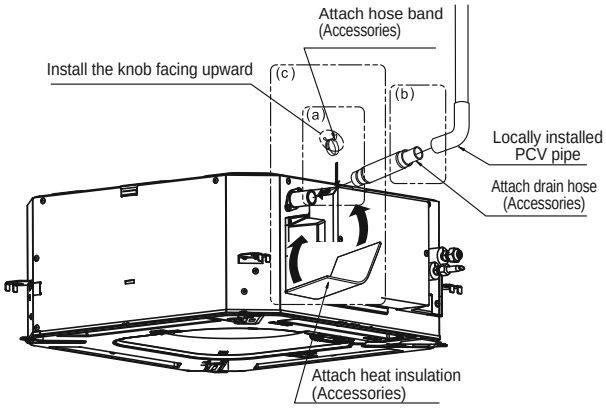
- Height of inclined pipe should be less than 700 mm from the ceiling. A rise dimension over this range will cause leakage.
- Lift up the pipe vertically at the position of 300 mm or less from the unit.



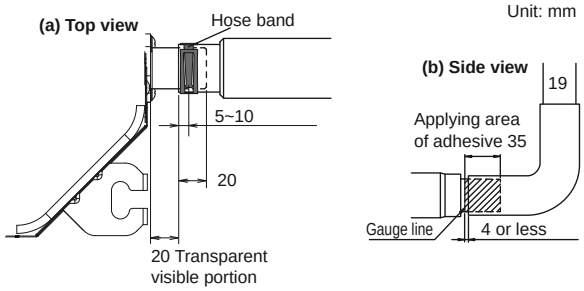


Installation procedure

1) Install the attached drain hose to the drain port of the body. Install the hose band from the top of the hose within the shown in the figure area.
2) Use vinyl adhesive agent to glue the drain piping (PVC pipe VP25) to the drain hose assembly.
   (Apply color adhesive agent evenly until the gauge line and seal)
3) Check the drainage. (See separate diagram)
4) Install the heat insulation.
5) Use the attached heat insulation to insulate the drain port and hose band.



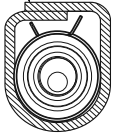
Unit: mm



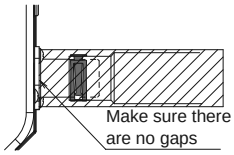
(c) Hose opening view

Wind the attached heat insulation around the hose band

Make sure the alignment is on top



• Top view



Note)

Check for drainage

Pour about 1 liter of water from the position (see 9. TEST RUN/CHECKING DRAINAGE). Check for any abnormalities such as strange noises and whether the drain pump functions normally

4. PIPE INSTALLATION

⚠ CAUTION
Be careful that foreign matter (oil, water, etc.) does not enter the piping with refrigerant R410A models. Also, when storing the piping, securely seal the openings by pinching, taping, etc.
While brazing the pipes, be sure to purge with dry nitrogen gas.

4.1. Selecting the pipe material

⚠ CAUTION
Do not use existing pipes.
Use pipes that have clean external and internal sides without any contamination which may cause trouble during use, such as sulfur, oxide, dust, cutting waste, oil or water.
It is necessary to use seamless copper pipes. Material: Phosphor deoxidized seamless copper pipes. It is desirable that the amount of residual oil is less than 40 mg/10 m.
Do not use copper pipes that have a collapsed, deformed, or discolored portion (especially on the interior surface). Otherwise, the expansion valve or capillary tube may become blocked with contaminants.
Improper pipe selection will degrade performance. As an air conditioner using R410A incurs pressure higher than when using conventional refrigerant, it is necessary to choose adequate materials.

- Thicknesses of copper pipes used with R410A are as shown in the table.
- Never use copper pipes thinner than those indicated in the table even if they are available on the market.

Thicknesses of Annealed Copper Pipes (R410A)

Pipe outside diameter [mm (in.)]	Thickness [mm]
6.35 (1/4)	0.80
9.52 (3/8)	0.80
12.70 (1/2)	0.80
15.88 (5/8)	1.00
19.05 (3/4)	1.20

4.2. Pipe requirement

⚠ CAUTION
Refer to the Installation Manual of the outdoor unit for description of the length and the diameter of connecting pipe or for difference of its elevation.

- Use pipe with water-resistant heat insulation.

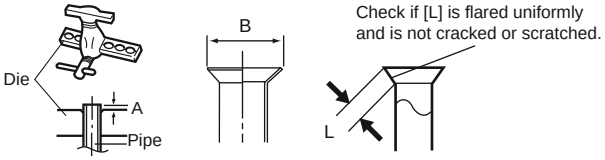
⚠ CAUTION
Install heat insulation around both the gas and liquid pipes. Failure to do so may cause water leaks. Use heat insulation with heat resistance above 120 °C. (Reverse cycle model only) In addition, if the humidity level at the installation location of the refrigerant piping is expected to exceed 70%, install heat insulation around the refrigerant piping. If the expected humidity level is 70-80%, use heat insulation that is 15 mm or thicker and if the expected humidity exceeds 80%, use heat insulation that is 20 mm or thicker. If heat insulation is used that is not as thick as specified, condensation may form on the surface of the insulation. In addition, use heat insulation with heat conductivity of 0.045W/(m·K) or less (at 20 °C).

4.3. Flare connection (pipe connection)

4.3.1. Flaring

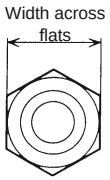
- Use special pipe cutter and flare tool exclusive for R410A.

(1) Cut the connection pipe to the necessary length with a pipe cutter.
(2) Hold the pipe downward so that cuttings will not enter the pipe and remove any burrs.
(3) Insert the flare nut (always use the flare nut attached to the indoor and outdoor units respectively) onto the pipe and perform the flare processing with a flare tool. Leakage of refrigerant may result if other flare nuts are used.
(4) Protect the pipes by pinching them or with tape to prevent dust, dirt, or water from entering the pipes.



Pipe outside diameter [mm (in.)]	Dimension A [mm] Flare tool for R410A, clutch type	Dimension $B^{0}_{-0.4}$ [mm]
6.35 (1/4)	0 to 0.5	9.1
9.52 (3/8)		13.2
12.70 (1/2)		16.6
15.88 (5/8)		19.7
19.05 (3/4)		24.0

When using conventional flare tools to flare R410A pipes, the dimension A should be approximately 0.5 mm more than indicated in the table (for flaring with R410A flare tools) to achieve the specified flaring. Use a thickness gauge to measure the dimension A.



Pipe outside diameter [mm (in.)]	Width across flats of Flare nut [mm]
6.35 (1/4)	17
9.52 (3/8)	22
12.70 (1/2)	26
15.88 (5/8)	29
19.05 (3/4)	36

4.3.2 Bending pipes

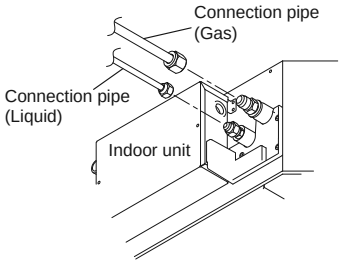
- If pipes are shaped by hand, be careful not to collapse them.
- Do not bend the pipes at an angle more than 90°.
- When pipes are repeatedly bend or stretched, the material will harden, making it difficult to bend or stretch them any more.
- Do not bend or stretch the pipes more than 3 times.

⚠ CAUTION
To prevent breaking of the pipe, avoid sharp bends.
If the pipe is bent repeatedly at the same place, it will break.

4.3.3. Pipe connection

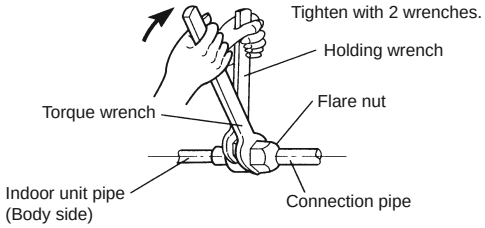
⚠ CAUTION
Be sure to connect the pipe against the port on the indoor unit and the outdoor unit correctly. If the centering is improper, the flare nut cannot tightened smoothly. If the flare nut is forced to turn, the threads will be damaged.
Do not remove the flare nut from the indoor unit pipe until immediately before connecting the connection pipe.
Do not use mineral oil on flared part. Prevent mineral oil from getting into the system as this would reduce the lifetime of the units.

(1) Detach the caps and plugs from the pipes.
(2) Center the pipe against the port on the indoor unit, and then turn the flare nut by hand.



(3) When the flare nut is tightened properly by your hand, hold the body side coupling with a separate spanner, then tighten with a torque wrench. (See the table below for the flare nut tightening torques.

⚠ CAUTION
Hold the torque wrench at its grip, keeping it in the right angle with the pipe, in order to tighten the flare nut correctly.
Tighten the flare nuts with a torque wrench using the specified tightening method. Otherwise, the flare nuts could break after a prolonged period, causing refrigerant to leak and generate a hazardous gas if the refrigerant comes into contact with a flame.

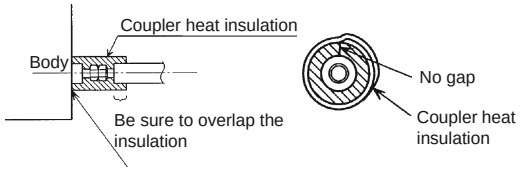


Flare nut [mm (in.)]	Tightening torque [N·m (kgf·cm)]
6.35 (1/4) dia.	16 to 18 (160 to 180)
9.52 (3/8) dia.	32 to 42 (320 to 420)
12.70 (1/2) dia.	49 to 61 (490 to 610)
15.88 (5/8) dia.	63 to 75 (630 to 750)
19.05 (3/4) dia.	90 to 110 (900 to 1,100)

4.4. Installing heat insulation

⚠ CAUTION
After checking for gas leaks (refer to the Installation Manual of the outdoor unit), perform this section.
Install heat insulation around both the large (gas) and small (liquid) pipes. Failure to do so may cause water leaks.

After checking for gas leaks, insulate by wrapping insulation around the 2 parts (gas and liquid) of the indoor unit coupling, using the Coupler Heat Insulation.
After installing the Coupler Heat Insulation, wrap both ends with vinyl tape so that there is no gap.



⚠ CAUTION
Must fit tightly against body without any gap.

5. ELECTRICAL WIRING

Cable	Cable size (mm²)	Type	Remarks
Connection cable	1.5 (MIN.)	Type 60245 IEC57	3Cable+Earth (Ground), 1φ230V

Max. Cable Length: Limit voltage drop to less than 2%. Increase cable gauge if voltage drop is 2% or more.

For simultaneous multi

	Conductor size (mm²)	Max length (m)
Bus wire	0.3 (MIN.)	500*

*This length shall be the total extended length in the system of the group.
(Total length of bus wire and remote controller cable.)

⚠ WARNING
Electrical work must be performed in accordance with this Manual by a person certified under the national or regional regulations. Be sure to use a dedicated circuit for the unit. An insufficient power supply circuit or improperly performed electrical work can cause serious accidents such as electric shock or fire.
Before starting work, check that power is not being supplied to the indoor unit and outdoor unit.
Use the included transmission cables and power cables or ones specified by the manufacturer. Improper connections, insufficient insulation, or exceeding the allowable current can cause electric shock or fire.
For wiring, use the prescribed type of wires, connect them securely, making sure that there are no external forces of the wires applied to the terminal connections. Improperly connected or secured wires can cause serious accidents such as overheating the terminals, electric shock, or fire.
Do not modify the power cables, use extension cables, or use any branches in the wiring. Improper connections, insufficient insulation, or exceeding the allowable current can cause electric shock or fire.
Match the terminal block numbers and connection cable colors with those of the outdoor unit or branch box. Erroneous wiring may cause burning of the electric parts.
Securely connect the connection cables to the terminal blocks. In addition, secure the cables with wiring holders. Improper connections, either in the wiring or at the ends of the wiring, can cause a malfunction, electric shock, or fire.
Always fasten the outside covering of the connection cable with the cable clamp. (If the insulator is chafed, electric leakage may occur.)
Securely install the electrical box cover on the unit. An improperly installed electrical box cover can cause serious accidents such as electric shock or fire through exposure to dust or water.
Install sleeves into any holes made in the walls for wiring. Otherwise, a short circuit could result.
Install a earth (ground) leakage breaker. In addition, install the earth (ground) leakage breaker so that the entire AC main power supply is cut off at the same time. Otherwise, electric shock or fire could result.
Always connect the earth (ground) wire. Improper earthing (grounding) work can cause electric shocks.
Install the remote controller cable and bus wire so as not to be direct touched with your hand.

(1) Use ring terminals with insulating sleeves as shown in the figure below to connect to the terminal block.
(2) Securely clamp the ring terminals to the wires using an appropriate tool so that the wires do not come loose.
(3) Use the specified wires, connect them securely, and fasten them so that there is no stress placed on the terminals.
(4) Use an appropriate screwdriver to tighten the terminal screws. Do not use a screwdriver that is too small, otherwise, the screw heads may be damaged and prevent the screws from being properly tightened.
(5) Do not tighten the terminal screws too much, otherwise, the screws may break.
(6) See the table 1 for the terminal screw tightening torques.

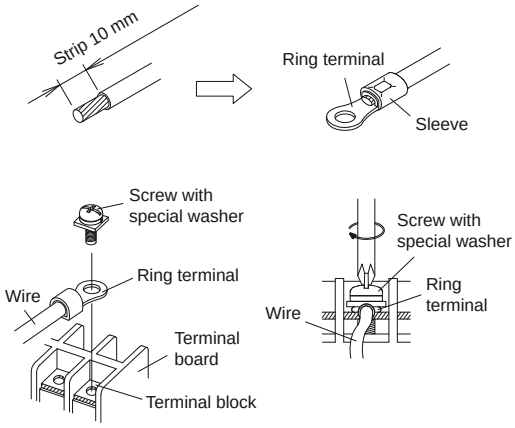


Table 1

Tightening torque	
M4 screw	**1.2 to 1.8 N·m (12 to 18 kgf·cm)**

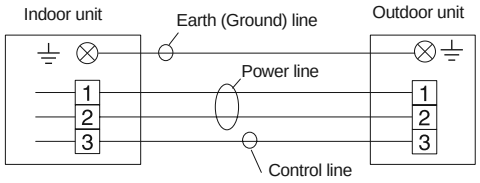
⚠ WARNING
Use crimp-type terminals and tighten the terminal screws to the specified torques, otherwise, abnormal overheating may be produced and possibly cause heavy damage inside the unit.

5.1. Wiring system diagram

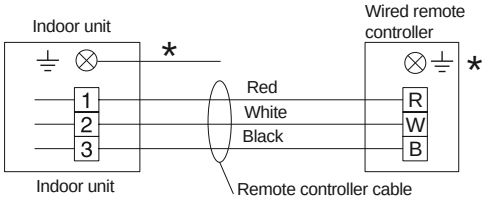
Connection diagrams

Standard pair

Connection cable



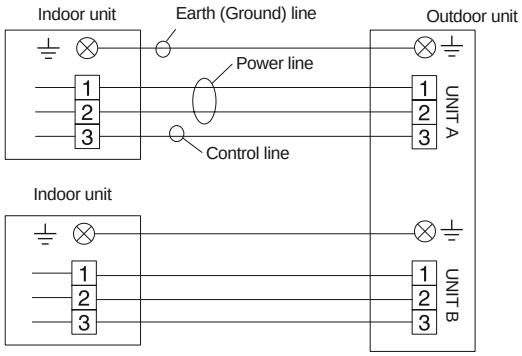
Wired remote controller cable



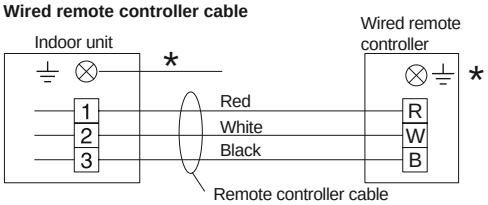
*Earth (Ground) the remote controller if it has a earth (ground) line.

Flexible multi

Connection cable



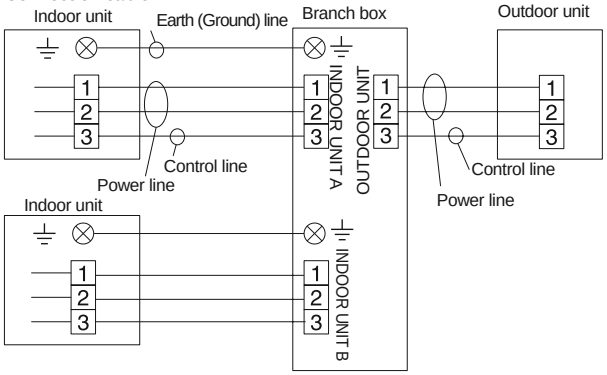
Wired remote controller cable



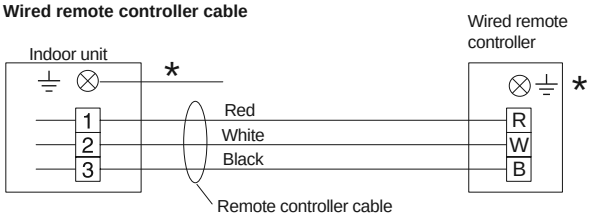
*Earth (Ground) the remote controller if it has a earth ground) line.

Flexible multi (branch box)

Connection cable



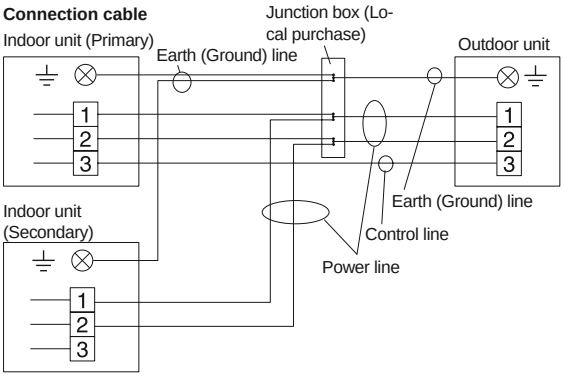
Wired remote controller cable



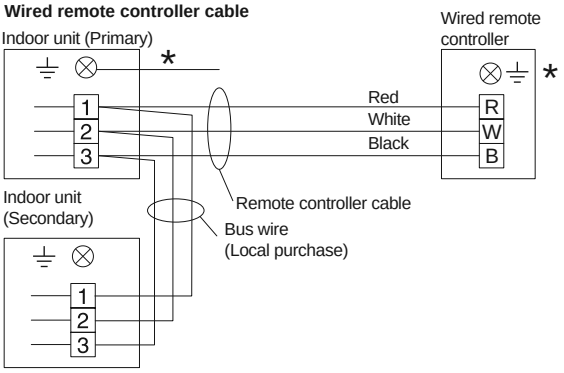
*Earth (Ground) the remote controller if it has a earth ground) line.

Simultaneous twin (18, 22, 24 type only)

Connection cable



Wired remote controller cable

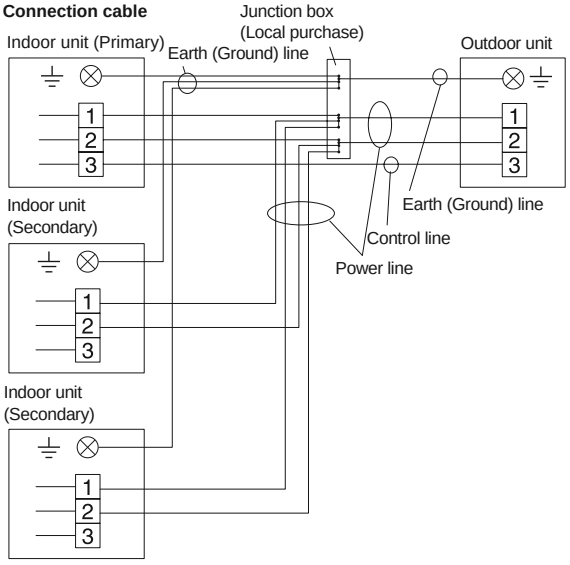


*Earth (Ground) the remote controller if it has a earth (ground) line.

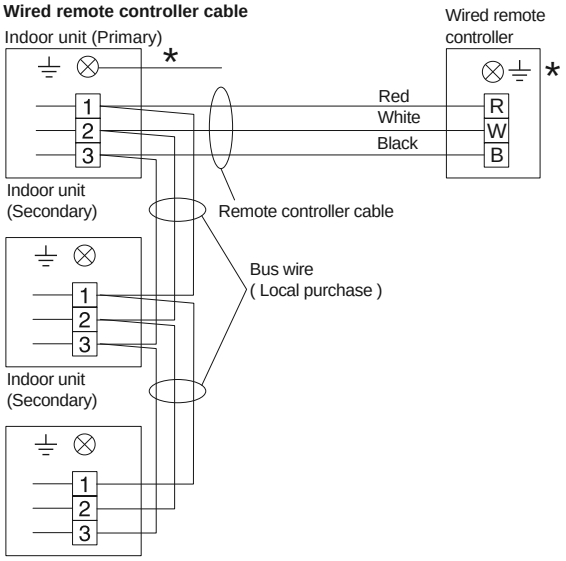
• Connect the remote controller wires to the primary unit.

Simultaneous triple (18 type only)

Connection cable



Wired remote controller cable



*Earth (Ground) the remote controller if it has a earth (ground) line.

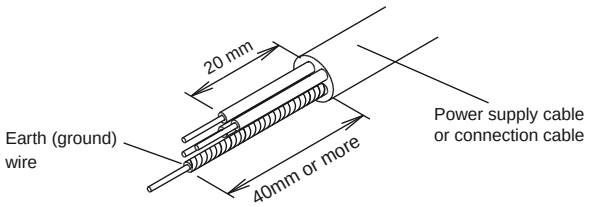
• Connect the remote controller wires to the primary unit.
Wired remote controller is recommended using simultaneous twin or triple connection.

⚠ CAUTION
Tighten the indoor unit connection cable and power supply indoor and outdoor unit, branch box terminal board connections firmly with the terminal board screws. Faulty connection may cause a fire.
If the indoor unit connection cable and power supply are wired incorrectly, the air conditioner may be damaged.
Connect the indoor unit connection cable by matching the numbers of the outdoor, branch box and indoor units terminal board numbers as shown in terminal label.
Earth (Ground) both the indoor and outdoor, branch box units by attaching an earth (ground) cable.
Unit shall be earthed (grounded) in compliance with the applicable local and national cables.

⚠ CAUTION
Be sure to refer to the above diagram for do correct field wiring. Wrong wiring causes malfunction of the unit.
Check local electrical rules and also any specific wiring instructions or limitation.

5.2. Connection cable preparation

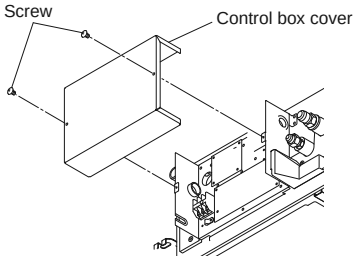
Keep the earth (ground) wire longer than the other wires.



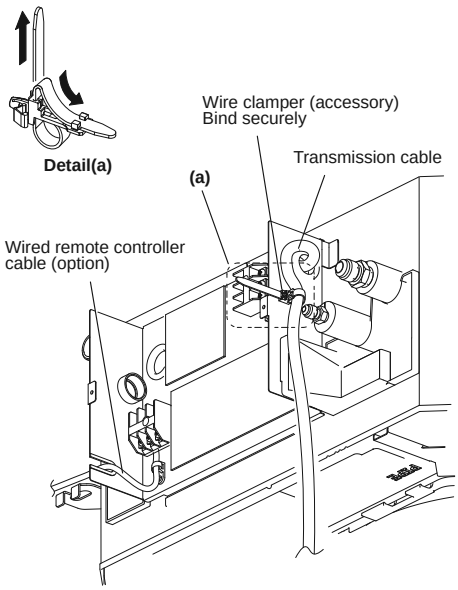
• Use a 4-core wire cable.

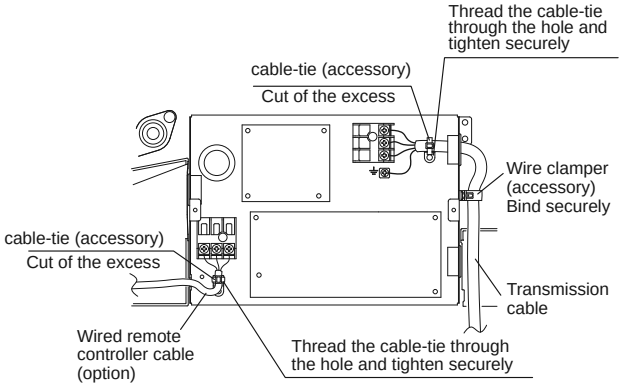
5.3. Connection of wiring

(1) Remove the control box cover and install each connection wire.



(2) After wiring is complete, secure the remote controller cable and transmission cable with the attached the cable-tie and the clamper.





(3) Install control box cover.

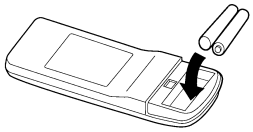
⚠ CAUTION
Do not wire the remote controller cable together with or parallel to the connection cables, and power supply cables of the INDOOR UNIT and OUTDOOR UNIT, BRANCH BOX. It may cause erroneous operation.

6. REMOTE CONTROLLER SETTING

Refer to the installation manual enclosed with the remote controller when the wired remote controller (option) is used.

6.1. Load batteries (R03/LR03 × 2)

(1) Press and slide the battery compartment lid on the reverse side to open it. Slide in the direction of the arrow while pressing the ▼ mark.
(2) Insert batteries.
Be sure to align the battery polarities (⊕ ⊖) correctly.
(3) Close the battery compartment lid.



⚠CAUTION
Take care to prevent infants from accidentally swallowing batteries.
When not using the Remote Controller for an extended period, remove the batteries to avoid possible leakage and damage to the unit.
If leaking battery fluid comes in contact with your skin, eyes, or mouth, immediately wash with copious amounts of water, and consult your physician.
Dead batteries should be removed immediately and disposed of properly, either in a battery collection receptacle or to the appropriate authority.
Do not attempt to recharge dry batteries.

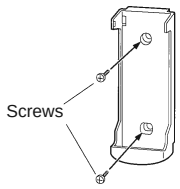
NOTE:
- Never mix new and used batteries, or batteries of different types.
- Batteries should last about 1 year under normal use. If the Remote Controller's operating range becomes appreciably reduced, replace the batteries and press the RESET button with the tip of a ballpoint pen or other small object.

6.2. Installing the remote controller holder

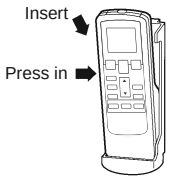
⚠CAUTION
Check that the indoor unit correctly receives the signal from the remote controller, then install the remote controller holder.
Select the remote controller holder selection site by paying careful attention to the following: Avoid places in direct sunlight. Select a place that will not be affected by the heat from a stove, etc.

- Install the remote controller with a distance of 7 m between the remote controller and the photocell as the criteria. However, when installing the remote controller, check that it operates positively.
- Install the remote controller holder to a wall, pillar, etc., with the tapping screw.

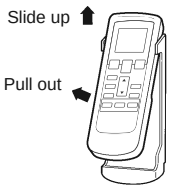
(1) Mount the holder.



(2) Set the remote controller.



(3) To remove the remote controller (when use at hand).

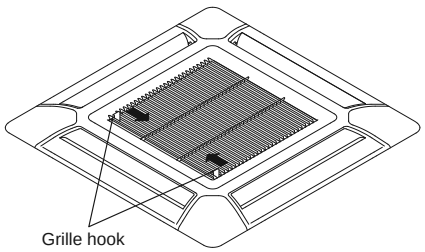


7. CASSETTE GRILLE INSTALLATION

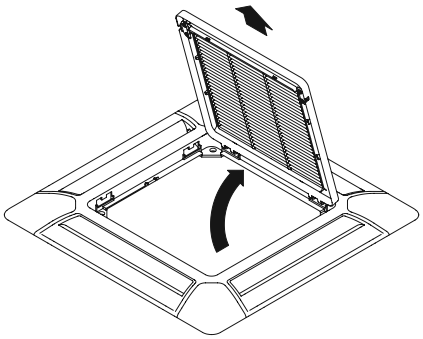
- Installation according to the Installation instruction sheet Cassette grille.
- Be sure to confirm there is no gap between the panel and main unit after installing the Cassette grille.

7.1. Remove the intake grille

(1) Slide the 2 grille hooks.

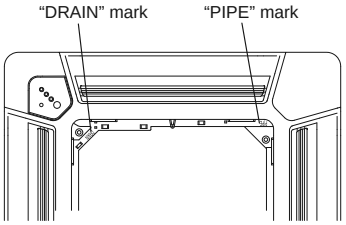


(2) Open the intake grille and remove.

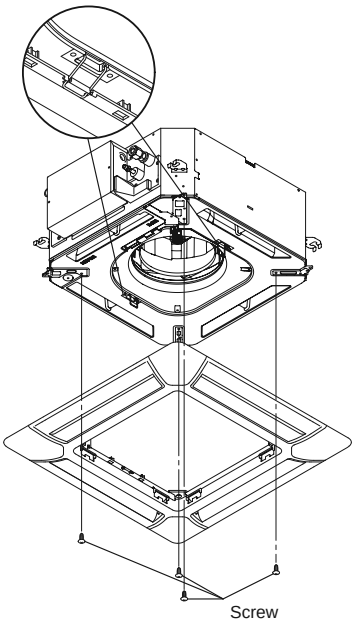


7.2. Installing the panel to indoor unit

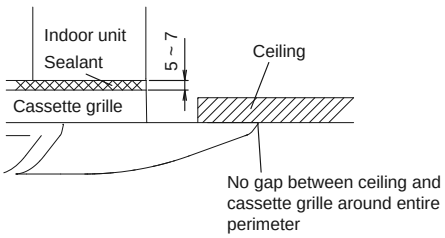
(1) Install the cassette grille on the indoor unit.



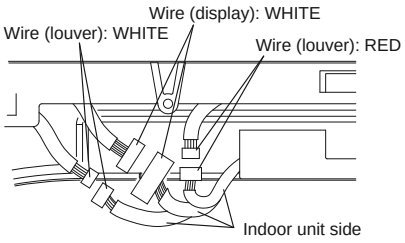
- Align the stamped marks on the cassette grille to the pipe and the drain of the indoor unit.



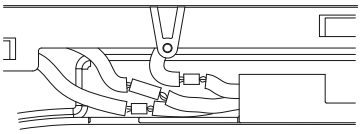
⚠CAUTION
Use only the supplied screws to install the cassette grille.



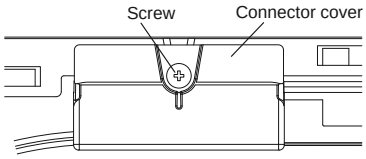
(2) Connect the connector.



• Arrange the wires as illustrated below.



(3) Attach the connector cover.



7.3. Attach the intake grille

The installation is the reverse of “REMOVING THE INTAKE GRILLE”.
The intake grille can be rotated and installed 4 ways to suit the user’s preference.

⚠CAUTION
The louver angle cannot be changed if the power is not on. (If moved by hand, it may be damaged.)
The grille assembly is directionally relative to the air conditioner body.
Install so that there is no gap between the grille assembly and the air conditioner body.
The cassette grille equips with an accessory to prevent the grill completely open. Be sure to read the INSTALLATION SHEET included with the cassette grille before installation.

8. FUNCTION SETTING

⚠ CAUTION
Confirm whether the wiring work for outdoor unit has been finished.
Confirm whether the cap for electric control box on the outdoor unit is close.

• This procedure changes to the function settings used to control the indoor unit according to the installation conditions. Incorrect settings can cause the indoor unit malfunction.
• After the power is turned on, perform the “FUNCTION SETTING” according to the installation conditions using the remote controller.
• The settings may be selected between the following two: Function Number or Setting Value.
• Settings will not be changed if invalid numbers or setting values are selected.
• Refer to the installation manual enclosed with the remote controller when the wired remote controller (option) is used.

8.1. Operation method

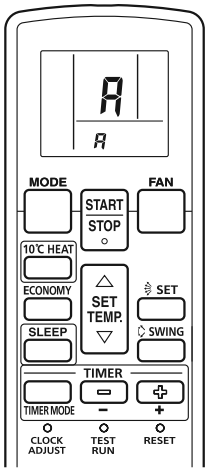
• While pressing the FAN button and SET TEMP. (▲) simultaneously, press the RESET button to enter the function setting mode.

STEP 1

Selecting the Remote Controller Signal Code

Use the following steps to select the signal code of the remote controller.
(Note that the air conditioner cannot receive a signal code if the air conditioner has not been set for the signal code.)
The signal codes that are set through this process are applicable only to the signals in the FUNCTION SETTING. For details on how to set the signal codes through the normal process, refer to SELECTING THE REMOTE CONTROLLER SIGNAL CODE.

(1) Press the SET TEMP. (▲) (▲) button to change the signal code between A→b→c→d.
Match the code on the display to the air conditioner signal code. (initially set to A) (If the signal code does not need to be selected, press the MODE button and proceed to STEP 2.)
(2) Press the TIMER MODE button and check that the indoor unit can receive signals at the displayed signal code.
(3) Press the MODE button to accept the signal code, and proceed to STEP 2.



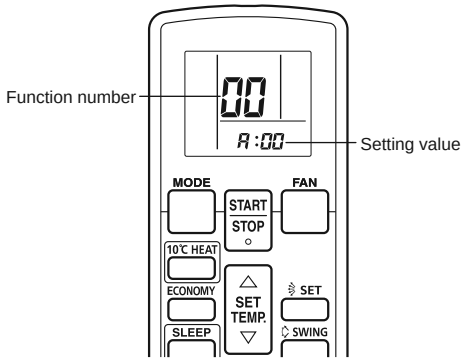
The air conditioner signal code is factory-set to A .
Contact your retailer to change the signal code.

The remote controller resets to signal code A when the batteries in the remote controller are replaced. If you use a signal code other than signal code A, reset the signal code after replacing the batteries.
If you do not know the air conditioner signal code setting, try each of the signal codes (A→b→c→d) until you find the code which operates the air conditioner.

STEP 2

Selecting the Function Number and Setting Value

(1) Press the SET TEMP. (▲) (▲) buttons to select the function number. (Press the MODE button to switch between the left and right digits.)
(2) Press the FAN button to proceed to setting the value. (Press the FAN button again to return to the function number selection.)
(3) Press the SET TEMP. (▲) (▲) buttons to select the setting value. (Press the MODE button to switch between the left and right digits.)
(4) Press the TIMER MODE button, and START/STOP button, in the order listed to confirm the settings.
(5) Press the RESET button to cancel the function setting mode.
(6) After completing the FUNCTION SETTING, be sure to turn off the power and turn it on again.



⚠ CAUTION
After turning off the power, wait 30 seconds or more before turning on it again. The FUNCTION SETTING doesn’t become effective if it doesn’t do so.

8.2. Function setting

(1) Filter sign

The indoor unit has a sign to inform the user that it is time to clean the filter. Select the time setting for the filter sign display interval in the table below according to the amount of dust or debris in the room. If you do not wish the filter sign to be displayed, select the setting value for “No indication”.

(◆... Factory setting)

	Setting description	Function number	Setting value
	Standard (2,500 hours)	11	00
	Long interval (4,400 hours)		01
	Short interval (1,250 hours)		02
◆	No indication		03

(2) Ceiling height

Select the setting values in the table below according to the height of the ceiling.

(◆... Factory setting)

	Setting description	Function number	Setting value
◆	Standard (2.7 m [9 ft])	20	00
	High ceiling (3.0 m [10 ft])		01

* However, 7000, 9000 Btu/h model can not be installed in high places.

(3) Outlet directions

Select the setting values in the table below for using a 3-way outlet.

(◆... Factory setting)

	Setting description	Function number	Setting value
◆	4-way	22	00
	3-way		01

(4) Cooling room temperature correction

Depending on the installed environment, the room temperature sensor may require a correction.
The settings may be selected as shown in the table below.

(◆... Factory setting)

	Setting description	Function number	Setting value
◆	Standard	30	00
	Slightly lower control		01
	Lower control		02
	Warmer control		03

(5) Heating room temperature correction

Depending on the installed environment, the room temperature sensor may require a correction.
The settings may be changed as shown in the table below.

(◆... Factory setting)

	Setting description	Function number	Setting value
◆	Standard	31	00
	Lower control		01
	Slightly warmer control		02
	Warmer control		03

(6) Auto restart

Enable or disable automatic system restart after a power outage.

(◆... Factory setting)

	Setting description	Function number	Setting value
◆	Yes	40	00
	No		01

* Auto restart is an emergency function such as for power failure etc. Do not start and stop the indoor unit by this function in normal operation. Be sure to operate by the control unit, or external input device.

(7) Indoor room temperature sensor switching function

(Only for Wired remote controller)
The following settings are needed using the Wired remote controller temperature sensor

(◆... Factory setting)

	Setting description	Function number	Setting value
◆	No	42	00
	Yes		01

* If setting value is “00”:
  Room temperature is controlled by the indoor unit temperature sensor.
* If setting value is “01”:
  Room temperature is controlled by either indoor unit temperature sensor or remote controller unit sensor.

(8) Wireless remote controller signal code

Change the indoor unit Signal Code, depending on the wireless remote controllers.

(◆... Factory setting)

	Setting description	Function number	Setting value
◆	A	44	00
	B		01
	C		02
	D		03

(9) External input control

“Operation/Stop” mode or “Forced stop” mode can be selected.

(◆... Factory setting)

	Setting description	Function number	Setting value
◆	Operation/Stop mode	46	00
	(Setting forbidden)		01
	Forced stop mode		02

Setting record

- Record any changes to the settings in the following table.

Setting	Setting Value
(1) Filter sign	
(2) Ceiling height	
(3) Outlet directions	
(4) Cooler room temperature correction	
(5) Heater room temperature correction	
(6) Auto restart	
(7) Indoor room temperature sensor switching function	
(8) Wireless remote controller signal code	
(9) External input control	

After completing the FUNCTION SETTING, be sure to turn off the power and turn it on again.

8.3. Selecting the remote controller signal code

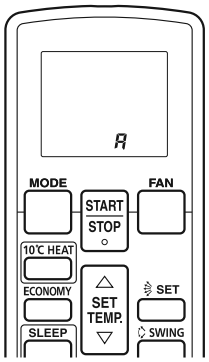
[When using the wireless remote controller]
When 2 or more air conditioners are installed in a room and the remote controller is operating an air conditioner other than the one you wish to set, change the signal code of the remote controller to operate only the air conditioner you wish to set (4 selections possible).
When 2 or more air conditioners are installed in a room, please contact your retailer to set the individual air conditioner signal codes.

Confirm the setting of the remote controller signal code and the printed circuit board setting.
If these are not confirmed, the remote controller cannot be used to operate for the air conditioner.

Selecting the Remote Controller Signal Code
Use the following steps to select the signal code of the remote controller. (Note that the air conditioner cannot receive a signal code if the air conditioner has not been set for the signal code.)

(1) Press the START/STOP button until only the clock is displayed on the remote controller display.
(2) Press the MODE button for at least 5 seconds to display the current signal code (initially set to A).
(3) Press the SET TEMP. (▲) (▼) button to change the signal code between A→b→c→d. Match the code on the display to the air conditioner signal code.

(4) Press the MODE button again to return to the clock display. The signal code will be changed.



If no buttons are pressed within 30 seconds after the signal code is displayed, the system returns to the original clock display. In this case, start again from step 1

The air conditioner signal code is set to A prior to shipment.
Contact your retailer to change the signal code.

The remote controller resets to signal code A when the batteries in the remote controller are replaced. If you use a signal code other than signal code A, reset the signal code after replacing the batteries.
If you do not know the air conditioner signal code setting, try each of the signal codes (A→b→c→d) until you find the code which operates the air conditioner.

8.4. Special installation methods

This possible only the wired remote controller (Option)

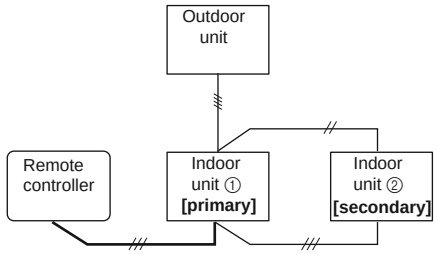
⚠ CAUTION
When setting DIP switches, do not touch any other parts on the circuit board directly with your bare hands.
Be sure to turn off the main power.

8.4.1. Simultaneous multi-system operation

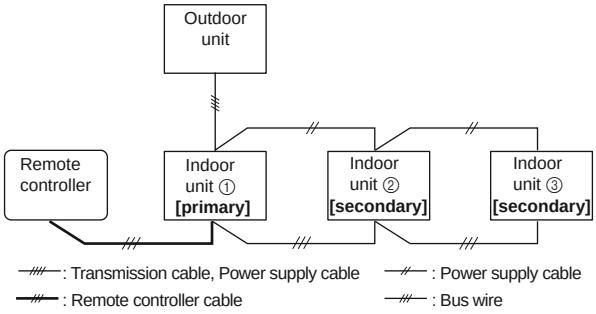
- By combining with an outdoor unit, 2 units for twin and 3 units for triple indoor units, can be switched ON/OFF simultaneously.

(1) Wiring method
- Refer to 5.ELECTRICAL WIRING for wiring procedure and wiring method.
- The indoor unit is connected the outdoor unit using a transmission cable is “primary”.
- Connect the remote controller wire to the primary unit.

Twin type (18, 22, 24 type only)

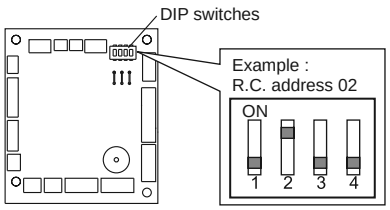


Triple type (18type only)



(2) Set the R.C. address (DIP switc h setting)
Set the R.C. address of each indoor unit using the DIP switches on the indoor unit circuit board. (See the following table and figure.)
The DIP switches are normally set to make the R.C. address 00.

Indoor unit	R.C. address	DIP SWITCH No.			
		1	2	3	4
①	00	OFF	OFF	OFF	OFF
②	01	ON	OFF	OFF	OFF
③	02	OFF	ON	OFF	OFF



Circuit board in the control box of indoor unit.

NOTE
Be sure to set the R.C. address sequentially.

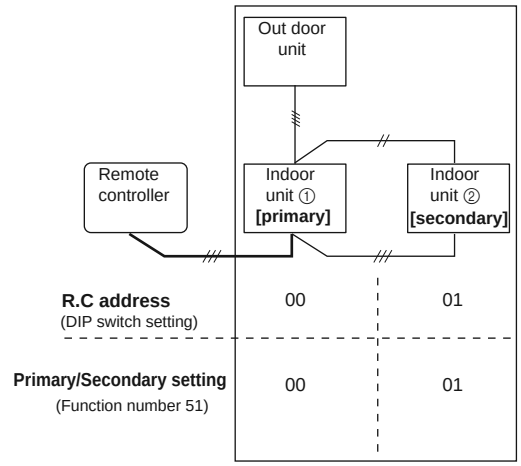
(3) Set the primary and secondary (Remote controller setting)
1. Turn on all of the indoor units.
2. Set the “primary” and “secondary” settings.
(Set the indoor unit that is connected to the outdoor unit using a transmission cable as the “primary”.)

	Function Number	Setting Value
Primary	51	00
Secondary		01

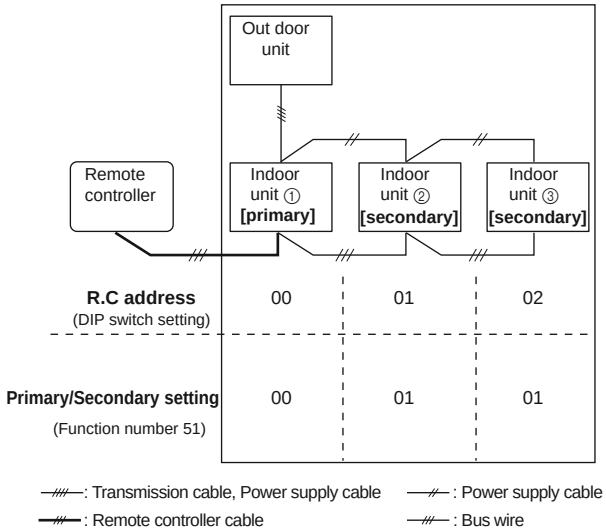
3. After completing the function settings, turn off all of the indoor units, and then turn them back on.

* If error code 21, 22, 24 or 27 is displayed, there may be an incorrect setting. Perform the remote controller setting again.

Twin type (18, 22, 24 type only)



Triple type (18type only)

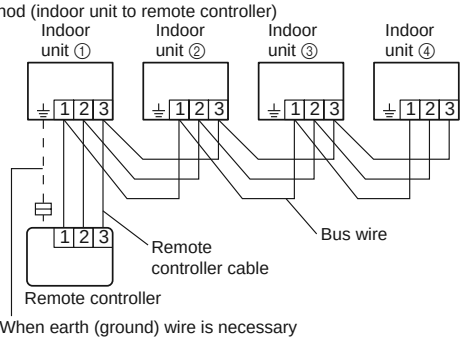


8.4.2. Group control system

⚠ CAUTION
Group control cannot be used when using it by the flexible multi type.

A number of indoor units can be operated at the same time using a single remote controller.

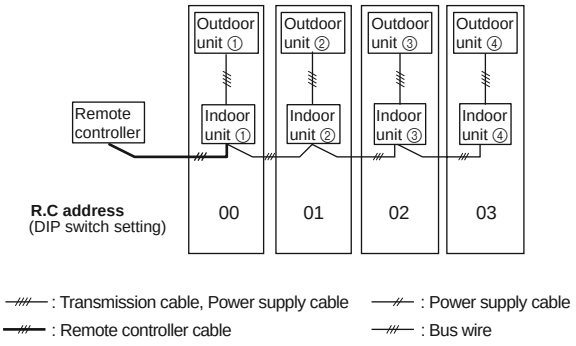
(1) Wiring method (indoor unit to remote controller)



(2) Set the R.C. address (DIP switch setting)
Set the R.C. address of each indoor unit using the DIP switches on the indoor unit circuit board. (See the following table and figure.)
The DIP switches are normally set to make the R.C. address 00.

Indoor unit	R.C. address	DIP SWITCH No.			
		1	2	3	4
①	00	OFF	OFF	OFF	OFF
②	01	ON	OFF	OFF	OFF
③	02	OFF	ON	OFF	OFF
④	03	ON	ON	OFF	OFF
⑤	04	OFF	OFF	ON	OFF
⑥	05	ON	OFF	ON	OFF
⑦	06	OFF	ON	ON	OFF
⑧	07	ON	ON	ON	OFF
⑨	08	OFF	OFF	OFF	ON
⑩	09	ON	OFF	OFF	ON
⑪	10	OFF	ON	OFF	ON
⑫	11	ON	ON	OFF	ON
⑬	12	OFF	OFF	ON	ON
⑭	13	ON	OFF	ON	ON
⑮	14	OFF	ON	ON	ON
⑯	15	ON	ON	ON	ON

NOTE
Be sure to set the R.C. address sequentially.



Settings when simultaneous Multi is included

(3) Set the refrigerant circuit address (Remote controller setting)
1. Turn on all of the indoor units.
* Turn on the indoor unit with the R.C. address 00 last.
(Within 1 minute)
2. Set the refrigerant circuit address.
Assign the same number to all of the indoor units connected to an outdoor unit.
(The unit is factory-set to "00")

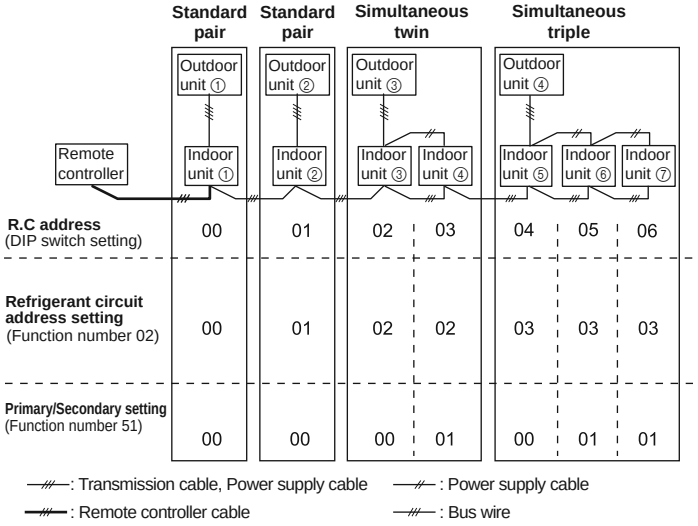
Refrigerant circuit address	Function Number	Setting Value
00	02	00～15
01		
⟆		
14		
15		

(4) Set the "primary" and "secondary" settings. (Remote controller setting)
(Set the indoor unit that is connected to the outdoor unit using a transmission cable as the "primary".)

	Function Number	Setting Value
Primary	51	00
Secondary		01

After completing the function settings, turn off all of the indoor units, and then turn them back on.
* If error code 21, 22, 24, or 27 is displayed, there may be an incorrect setting. Perform the remote controller setting again.

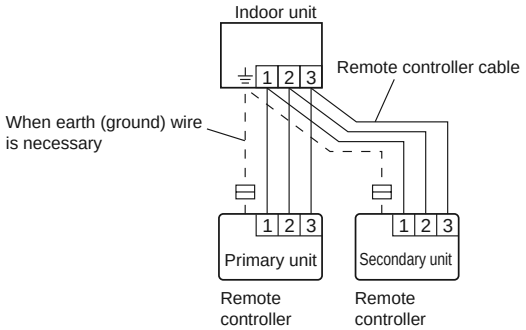
NOTE
- When different indoor unit models are connected using the group control system, some functions may no longer be available.
- If the group control system contains multiple units that are operated simultaneously, connect and set the units as shown below.
- Auto-changeover operates under the same mode with model R.C. address 00.
- It should not be connected to any other Gr that is not of the same series (A**G only).



8.4.3. Dual remote controllers

- 2 separate remote controllers can be used to operate the indoor units.
- The timer and self-diagnosis functions cannot be used on the secondary unit of remote controller.

(1) Wiring method (indoor unit to remote controller)



(2) Remote controller DIP switch 1 setting
Set the remote controller DIP switch 1-No. 2 according to the following table.

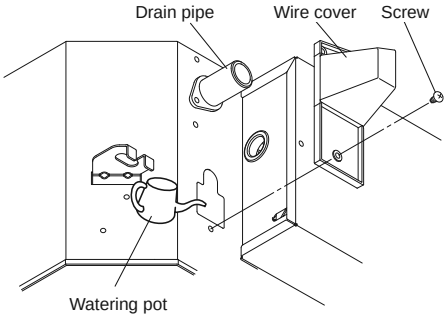
	DIP SW 1-No. 2
Primary unit	OFF
Secondary unit	ON

9. TEST RUN

CHECK ITEMS

(1) Is operation of each button on the remote controller normal?
(2) Does each lamp light normally?
(3) Do not air flow direction louvers operate normally?
(4) Is the drain normal?
(5) Is there any error noise and vibration during operation?
• Do not operate the air conditioner test run for a long time.

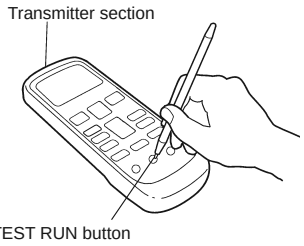
CHECKING DRAINAGE.
To check the drain, remove the water cover and fill with 1 liter of water as shown in the figure.
The drain pump operates when operating in the cooling mode.



• Test running

When the air conditioner is run by pressing the remote controller test run button, the OPERATION and TIMER lamps flash slowly at the same time.

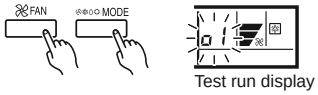
[Operation method]
• For the operation method, refer to the operating manual.
• The outdoor unit may not operate depending on the room temperature.
In this case, press the TEST RUN button on the remote controller while the air conditioner is running. (Point the transmitter section of the remote controller toward the air conditioner and press the TEST RUN button with the tip of a ball-point pen, etc.)



• To end test operation, press the remote controller START/STOP button.
(When the air conditioner is run by pressing the TEST RUN button, the OPERATION Lamp and TIMER Lamp will simultaneously flash slowly.)

[Using the wired remote control] (Option)

• For the operation method, refer to the operating manual.
(1) Stop the air conditioner operation.
(2) Press the MODE button and the FAN button simultaneously for 2 seconds or more to start the test run.



(3) Press the START/STOP button to stop the test run.

If “C0” appears in the R.C. address display, there is a remote controller error. Refer to the installation manual included with the remote controller.

R.C. address	Error code	Content
C0	15	Incompatible indoor unit is connected
C0	12	Indoor unit ↔ remote controller communication error

10.CHECK LIST

Pay special attention to the check items below when installing the indoor unit(s). After installation is complete, be sure to check the following check items again.

CHECK ITEMS	If not performed correctly	CHECK BOX
Has the indoor unit been installed correctly?	Vibration, noise, indoor unit may drop	
Has there been a check for gas leaks (refrigerant pipes)?	No cooling, No heating	
Has heat insulation work been completed?	Water leakage	
Does water drain easily from the indoor units?	Water leakage	
Are the wires and pipes all connected completely?	No operation, heat or burn damage	
Is the connection cable the specified thickness?	No operation, heat or burn damage	
Are the inlets and outlets free of any obstacles?	No cooling, No heating	
After installation is completed, has the proper operation and handling been explained to the user?		

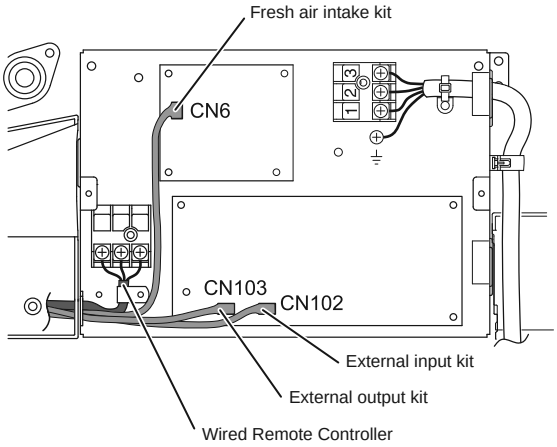
11.OPTIONAL KIT INSTALLATION (OPTION)

⚠ WARNING

Regulation of cable differs from each locality, refer in accordance with local rules.

This air conditioner can be connected with the following optional kits.

Option type	Connector No.
Fresh air intake	CN6
External input	CN102
External output	CN103
Wired Remote Controller	–



12.CUSTOMER GUIDANCE

Explain the following to the customer in accordance with the operating manual:
(1) Starting and stopping method, operation switching, temperature adjustment, timer, air flow switching, and other remote controller unit operations.
(2) Air filter removal and cleaning, and how to use the air louvers.
(3) Give the operating and Installation Manuals to the customer.
(4) If the signal code is changed, explain to the customer how it changed (the system returns to signal code A when the batteries in the remote controller unit are replaced).
*(4) is applicable to using wireless remote controller.

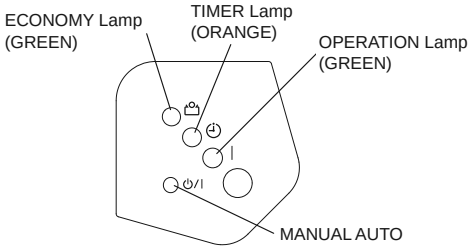
13.ERROR CODES

If you use a wireless remote controller, the lamp on the photo detector unit will output error codes by way of blinking patterns. If you use a wired type remote controller, error codes will appear on the remote controller display. See the lamp blinking patterns and error codes in the table. An error display is displayed only during operation.

Error display			Wired remote controller Error code	Description
OPERATION lamp (green)	TIMER lamp (orange)	ECONOMY lamp (green)		
●(1)	●(1)	◇	11	Serial communication error
●(1)	●(2)	◇	12	Wired remote controller communication error
●(1)	●(5)	◇	15	Check run unfinished
●(2)	●(1)	◇	21	R.C. address or Refrigerant circuit address setting error [Simultaneous Multi]
●(2)	●(2)	◇	22	Indoor unit capacity error
●(2)	●(3)	◇	23	Combination error
●(2)	●(4)	◇	24	• Connection R.C. address error (indoor secondary unit) [Simultaneous Multi] • Connection R.C. address error (indoor unit or branch unit) [Flexible Multi]
●(2)	●(7)	◇	27	Primary unit, secondary unit set-up error [Simultaneous Multi]
●(3)	●(1)	◇	31	Power supply interruption error
●(3)	●(2)	◇	32	Indoor unit PCB model information error
●(3)	●(5)	◇	35	Manual auto switch error
●(4)	●(1)	◇	41	Inlet air temp. sensor error
●(4)	●(2)	◇	42	Indoor unit Heat Ex. Middle temp. sensor error
●(5)	●(1)	◇	51	Indoor unit fan motor error
●(5)	●(3)	◇	53	Drain pump error
●(5)	●(7)	◇	57	Damper error
●(5)	●(15)	◇	5U	Indoor unit error
●(6)	●(2)	◇	62	Outdoor unit main PCB model information error or communication error
●(6)	●(3)	◇	63	Inverter error
●(6)	●(4)	◇	64	Active filter error, PFC circuit error
●(6)	●(5)	◇	65	Trip terminal L error
●(6)	●(10)	◇	6A	Display PCB microcomputers communication error
●(7)	●(1)	◇	71	Discharge temp. sensor error
●(7)	●(2)	◇	72	Compressor temp. sensor error
●(7)	●(3)	◇	73	Outdoor unit Heat Ex. liquid temp. sensor error
●(7)	●(4)	◇	74	Outdoor temp. sensor error
●(7)	●(5)	◇	75	Suction Gas temp. sensor error
●(7)	●(6)	◇	76	• 2-way valve temp. sensor error • 3-way valve temp. sensor error
●(7)	●(7)	◇	77	Heat sink temp. sensor error
●(8)	●(2)	◇	82	• Sub-cool Heat Ex. gas inlet temp. sensor error • Sub-cool Heat Ex. gas outlet temp. sensor error
●(8)	●(3)	◇	83	Liquid pipe temp. sensor error
●(8)	●(4)	◇	84	Current sensor error
●(8)	●(6)	◇	86	• Discharge pressure sensor error • Suction pressure sensor error • High pressure switch error
●(9)	●(4)	◇	94	Trip detection
●(9)	●(5)	◇	95	Compressor rotor position detection error (permanent stop)
●(9)	●(7)	◇	97	Outdoor unit fan motor 1 error
●(9)	●(8)	◇	98	Outdoor unit fan motor 2 error
●(9)	●(9)	◇	99	4-way valve error
●(9)	●(10)	◇	9A	Coil (expansion valve) error
●(10)	●(1)	◇	A1	Discharge temp. error
●(10)	●(3)	◇	A3	Compressor temp. error
●(10)	●(4)	◇	A4	High pressure error
●(10)	●(5)	◇	A5	Low pressure error
●(13)	●(2)	◇	J2	Branch boxes error [Flexible Multi]

Display mode ● : 0.5s ON / 0.5s OFF
◇ : 0.1s ON / 0.1s OFF
( ) : Number of flashing

[Troubleshooting with the indoor unit display]

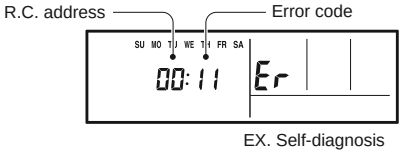


[Troubleshooting at the remote controller LCD]

This is possible only on the wired remote controller.

[Self-diagnosis]

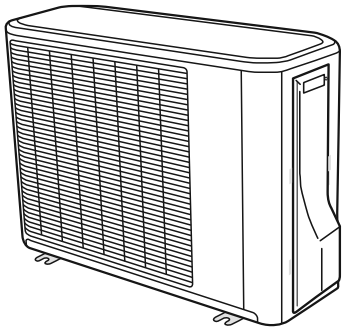
If an error occurs, the following display will be shown.
("Er" will appear in the set room temperature display.)



EX. Self-diagnosis

AIR CONDITIONER
OUTDOOR UNIT

INSTALLATION MANUAL



INSTALLATION MANUAL
For authorized service personnel only.

English

INSTALLATIONSANLEITUNG
Nur für autorisiertes Personal.

Deutsch

MANUEL D'INSTALLATION
Pour le personnel agréé uniquement.

Français

MANUAL DE INSTALACIÓN
Solo para personal autorizado.

Español

MANUALE D'INSTALLAZIONE
Ad uso esclusivo del personale autorizzato.

Italiano

ΕΓΧΕΙΡΙΔΙΟ ΕΓΚΑΤΑΣΤΑΣΗΣ
Για εξουσιοδοτημένο προσωπικό σέρβις.

Ελληνικά

MANUAL DE INSTALAÇÃO
Apenas para técnicos autorizados.

Português

РУКОВОДСТВО ПО УСТАНОВКЕ
Для уполномоченного персонала.

Русский

KURULUM KILAVUZU
Yetkili servis personeli içindir.

Türkçe

PART No. 9377863195

AIR CONDITIONER
OUTDOOR UNIT

INSTALLATION MANUAL

9377863195

Contents

1. SAFETY PRECAUTIONS 1
2. ABOUT THE UNIT 1
3. SELECTING THE MOUNTING POSITION 3
4. INSTALLATION DIAGRAM 3
5. INSTALLATION 4
6. PUMP DOWN 6

Notes:
- This manual describes how to install the outdoor unit only. To install the indoor unit, refer to the installation manual included with the indoor unit.
- Be sure to read this manual thoroughly before the installation.
- Hand this manual, together with the operating manual, to the customer. Request the customer to keep them on hand for future use, such as for relocating or repairing the unit.
- After the installation, explain correct operation to the customer by using the operating manual.

1. SAFETY PRECAUTIONS

- Be sure to read this manual carefully before installation.
- The warnings and precautions indicated in this manual contain important information pertaining to your safety. Be sure to observe them.
- Hand this manual, together with the operating manual, to the customer. Request the customer to keep them on hand for future use, such as for relocating or repairing the unit.

⚠ **WARNING**	This mark indicates procedures which, if improperly performed, might lead to the death or serious injury of the user.

⚠ **CAUTION**	This mark indicates procedures which, if improperly performed, might possibly result in personal harm to the user, or damage to property.

⚠ **WARNING**
Never touch electrical components immediately after the power supply has been turned off. Electrical shock may occur. After turning off the power, always wait 10 minutes or more before touching electrical components.
Request your dealer or a professional installer to install the outdoor unit in accordance with this installation manual. an improperly installed unit can cause serious accidents such as water leakage, electric shock, or fire. If the outdoor unit is installed in disregard of the instructions in the installation manual, it will void the manufacturer's warranty.
Do not turn ON the power until all work has been completed. Turning ON the power before the work is completed can cause serious accidents such as electric shock or fire.
If refrigerant leaks while work is being carried out, ventilate the area. If the refrigerant comes in contact with a flame, it produces a toxic gas.
Installation work must be performed in accordance with national wiring standards by authorized personnel only.
Do not use this equipment with air or any other unspecified refrigerant in the refrigerant lines. Excess pressure can cause a rupture.
During installation, make sure that the refrigerant pipe is attached firmly before you run the compressor. Do not operate the compressor under the condition of refrigerant piping not attached properly with 2-way or 3-way valve open. This may cause abnormal pressure in the refrigeration cycle that leads to rupture and even injury.
When installing and relocating the air conditioner, do not mix gases other than the specified refrigerant (R410A) to enter the refrigerant cycle. If air or other gas enters the refrigerant cycle, the pressure inside the cycle will rise to an abnormally high value and cause rupture, injury, etc.
For the air conditioner to operate satisfactorily, install it as outlined in this installation manual.
Connect the indoor unit and outdoor unit with the air conditioner piping and cable available standards parts. This installation manual describes the correct connections using the installation set available from our standard parts.
Also, do not use an extension cable.
Do not purge the air with refrigerants but use a vacuum pump to vacuum the installation.
There is not extra refrigerant in the outdoor unit for air purging.
Using the same vacuum pump for different refrigerants may damage the vacuum pump or the unit.
Use a clean gauge manifold, vacuum pump and charging hose for R410A exclusively.
During the pump-down operation, make sure that the compressor is turned off before you remove the refrigerant piping. Do not remove the connection pipe while the compressor is in operation with 2 way or 3 way valve open. This may cause abnormal pressure in the refrigeration cycle that leads to rupture and even injury.

⚠ **CAUTION**
Read carefully all security information before use or install the air conditioner.
Do not attempt to install the air conditioner or a part of the air conditioner by yourself.
This unit must be installed by qualified personnel with a capacity certificate for handling refrigerant fluids. Refer to regulation and laws in use on installation place.
The installation must be carried out in compliance with regulations in force in the place of installation and the installation instructions of the manufacturer.
This unit is part of a set constituting an air conditioner. It must not be installed alone or with non-authorized by the manufacturer.
The unit must be correctly earthed (grounded) and the supply line must be equipped with a differential breaker in order to protect the persons.
The units are not explosion proof and therefore should not be installed in explosive atmosphere.
This unit contains no user-serviceable parts. Always consult authorized service personnel to repairs.
When moving, consult authorized service personnel for disconnection and installation of the unit.
Children should be monitored to ensure they do not play with the device.
This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.
Do not touch the aluminum fins of heat exchanger built-in the indoor or outdoor unit to avoid personal injury when you install or maintain the unit.
Do not place any other electrical products or household belongings under indoor unit or outdoor unit. Dripping condensation from the unit might get them wet, and may cause damage or malfunction of your property.

2. ABOUT THE UNIT

2.1. Precautions for using R410A refrigerant

The basic installation work procedures are the same as conventional refrigerant (R22) models. However, pay careful attention to the following points:
Since the working pressure is 1.6 times higher than that of conventional refrigerant (R22) models, some of the piping and installation and service tools are special. (See the table below.) Especially, when replacing a conventional refrigerant (R22) model with a new refrigerant R410A model, always replace the conventional piping and flare nuts with the R410A piping and flare nuts.
Models that use refrigerant R410A have a different charging port thread diameter to prevent erroneous charging with conventional refrigerant (R22) and for safety. Therefore, check beforehand. [The charging port thread diameter for R410A is 1/2 inch.]
Be more careful that foreign matter (oil, water, etc.) does not enter the piping than with refrigerant (R22) models. Also, when storing the piping ,securely seal the opening by pinching, taping, etc.
When charging the refrigerant, take into account the slight change in the composition of the gas and liquid phases. And always charge from the liquid phase where refrigerant composition is stable.

2.2. Special tools for R410A

Tool name	Contents of change
Gauge manifold	Pressure is high and cannot be measured with a conventional (R22) gauge. To prevent erroneous mixing of other refrigerants, the diameter of each port has been changed. It is recommended the gauge with seals -0.1 to 5.3 MPa (-1 to 53 bar) for high pressure. -0.1 to 3.8 MPa (-1 to 38 bar) for low pressure.
Charge hose	To increase pressure resistance, the hose material and base size were changed.
Vacuum pump	A conventional vacuum pump can be used by installing a vacuum pump adapter.
Gas leakage detector	Special gas leakage detector for HFC refrigerant R410A.

Copper pipes

It is necessary to use seamless copper pipes and it is desirable that the amount of residual oil is less than 40 mg/10 m. Do not use copper pipes having a collapsed, deformed or discolored portion (especially on the interior surface). Otherwise, the expansion value or capillary tube may become blocked with contaminants.
As an air conditioner using R410A incurs pressure higher than when using R22, it is necessary to choose adequate materials.
Thicknesses of copper pipes used with R410A are as shown in table below. Never use copper pipes thinner than 0.8mm even when it is available on the market.

Thicknesses of Annealed Copper Pipes

Pipe outside diameter	Thickness
6.35 mm (1/4 in.)	0.80 mm
9.52 mm (3/8 in.)	0.80 mm
12.70 mm (1/2 in.)	0.80 mm
15.88 mm (5/8 in.)	1.00 mm
19.05 mm (3/4 in.)	1.20 mm

⚠ WARNING

Do not use the existing (for R22) piping and flare nuts.
If the existing materials are used, the pressure inside the refrigerant cycle will rise and cause failure, injury, etc. (Use the special R410A materials.)

When installing and relocating the air conditioner, do not mix gases other than the specified refrigerant (R410A) to enter the refrigerant cycle.
If air or other gas enters the refrigerant cycle, the pressure inside the cycle will rise to an abnormally high value and cause failure, injury, etc.

2.3. Power

⚠ WARNING

Always use a special branch circuit and install a special receptacle to supply power to the room air conditioner.

Use a circuit breaker and receptacle matched to the capacity of the air conditioner.

Do not extend the power cable.

Perform wiring work in accordance with standards so that the air conditioner can be operated safely and positively.

Install a leakage circuit breaker in accordance with the related laws and regulations and electric company standards.

The circuit breaker is installed in the permanent wiring. Always use a circuit that can trip all the poles of the wiring and has an isolation distance of at least 3 mm between the contacts of each pole.

⚠ CAUTION

The power source capacity must be the sum of the air conditioner current and the current of other electrical appliances. When the current contracted capacity is insufficient, change the contracted capacity.

When the voltage is low and the air conditioner is difficult to start, contact the power company the voltage raised.

2.4. Electric requirement

⚠ CAUTION

Be sure to install a breaker of the specified capacity.

Regulation of cables and breaker differs from each locality, refer in accordance with local rules.

Voltage rating	1 ø 230 V (50 Hz)
Operating range	198-264 V

Cable	Cable size [mm^2]*1	Type	Remarks
Power supply cable	4.0	Type 60245 IEC66	2cable + Earth (Ground), 1ø230V
Connection cable	1.5	Type 60245 IEC57	3cable + Earth (Ground), 1ø230V

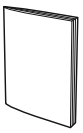
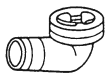
*1 Selected sample: Select the correct cable type and size according to the country or region's regulations.
Max. wire length: Set a length so that the voltage drop is less than 2%. Increase the wire diameter when the wire length is long.

Breaker	Specification*2
Circuit breaker (over current)	Current : 25 (A)
Earth leakage breaker	Leakage current : 30mA 0.1sec or less*3

*2 Select the appropriate breaker of the described specification according to the national or regional standards.
*3 Select the breaker that enough load current can pass through it.

- Before starting work check that power is not being supplied to all poles of the indoor unit and outdoor unit.
- Install all electrical works in accordance to the national standard.
- Install the disconnect device with a contact gap of at least 3 mm in all poles nearby the units. (Both indoor unit and outdoor unit)
- Install the circuit breaker nearby the units.

2.5. Accessories

Name and Shape	Q'ty	Application
Installation Manual 	1	This manual
Drain pipe 	1	For outdoor unit drain piping work

2.6. Limitation of refrigerant piping length

⚠ CAUTION

The total maximum pipe lengths and height difference of this product are shown in the table.
If the units are further apart than this, correct operation cannot be guaranteed.

Pipe length		Maximum height (between indoor and outdoor)
MAX.	MIN.	
30 m	5 m	20 m

2.7. Additional charge

Refrigerant suitable for a piping length of 15 m is charged in the outdoor unit at the factory.
When the piping is longer than 15 m, additional charging is necessary.
For the additional amount, see the table below.

Pipe length	15 m	20 m	25 m	30 m
Additional amount	None	100 g	200 g	300 g

⚠ CAUTION

When adding refrigerant, add the refrigerant from the charging port at the completion of work.

The maximum length of the piping is 30 m. The maximum height difference of the piping is 20 m, if the units are further apart than these, correct operation cannot be guaranteed.

Between 15 m and 30 m, when using a connection pipe other than that in the table, charge additional refrigerant with 20 g/1 m as the criteria.

2.8. Selecting pipe sizes

The diameters of the connection pipes differ according to the capacity of the indoor unit.
Refer to the following table for the proper diameters of the connection pipes between the indoor and outdoor units.

Capacity of indoor unit	Gas pipe size (thickness) [mm]	Liquid pipe size (thickness) [mm]
24	ø15.88 (1.0)	ø6.35 (0.8)

⚠ CAUTION

Operation cannot be guaranteed if the correct combination of pipes, valves, etc., is not used to connect the indoor and outdoor units.

2.9. Heat insulation around connection pipes requirements

⚠ CAUTION

Install heat insulation around both the gas and liquid pipes.
Failure to do so may cause water leaks.
Use heat insulation with heat resistance above 120 °C. (Reverse cycle model only)
In addition, if the humidity level at the installation location of the refrigerant piping is expected to exceed 70%, install heat insulation around the refrigerant piping. If the expected humidity level is 70-80%, use heat insulation that is 15 mm or thicker and if the expected humidity exceeds 80%, use heat insulation that is 20 mm or thicker.
If heat insulation is used that is not as thick as specified, condensation may form on the surface of the insulation.
In addition, use heat insulation with heat conductivity of 0.045 W/(m·K) or less (at 20 °C).

Connect the connection pipes according to "5.3. Connecting the piping" in this installation manual.

3. SELECTING THE MOUNTING POSITION

With considering written conditions below, select an appropriate installing location in consultation with the customer.

⚠ WARNING

Securely install the outdoor unit at a location that can withstand the weight of the unit. Otherwise, the outdoor unit may fall and cause injury.

Be sure to install the outdoor unit as prescribed, so that it can withstand earthquakes or strong winds. Improper installation can cause the unit to topple or fall, or other accidents.

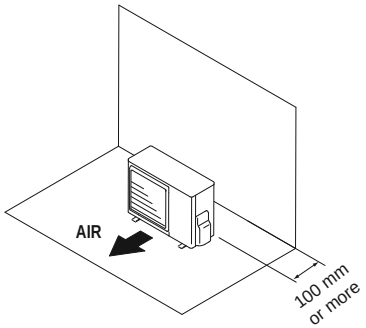
⚠ CAUTION

Do not install the outdoor unit in the following areas:

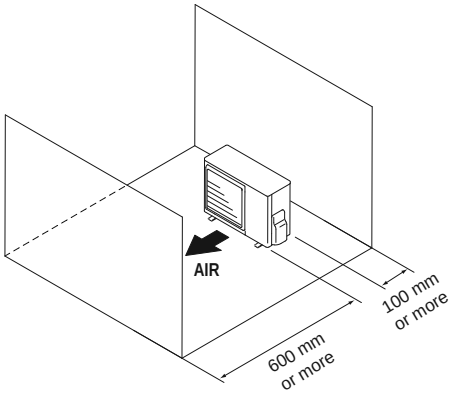
- Area with high salt content, such as at the seaside. It will deteriorate metal parts, causing the parts to fail or the unit to leak water.
- Area filled with mineral oil or containing a large amount of splashed oil or steam. It will deteriorate plastic parts, causing the parts to fail or the unit to leak water.
- Area that generates substances that adversely affect the equipment, such as sulfuric gas, chlorine gas, acid, or alkali. It will cause the copper pipes and brazed joints to corrode, which can cause refrigerant leakage.
- Area containing equipment that generates electromagnetic interference. It will cause the control system to malfunction, preventing the unit from operating normally.
- Area that can cause combustible gas to leak, contains suspended carbon fibers or flammable dust, or volatile inflammables such as paint thinner or gasoline. If gas leaks and settles around the unit, it can cause a fire.
- Area that has heat sources, vapors, or the risk of the leakage of flammable gas in the vicinity.
- Area where small animals may live. It may cause failure, smoke or fire if small animals enter and touch internal electrical parts.
- Area where animals may urinate on the unit or ammonia may be generated.

(1) If possible, do not install the unit where it will be exposed to direct sunlight. (If necessary, Install a blind that does not interfere with the air flow.)
(2) Do not install the unit where a strong wind blows or where it is very dusty.
(3) Do not install the unit where people pass.
(4) Take you neighbors into consideration so that they are not disturbed by air blowing into their windows or by noise.
(5) Provide the space shown in figure so that the air flow is not blocked. Also for efficient operation, leave open three of the four directions front, rear, and both sides.
(6) Install the unit where keep away more than 3m from the antenna of TV set and Radio.
(7) Outdoor unit should be set to a place where both drainage and itself will not be affected when heating.

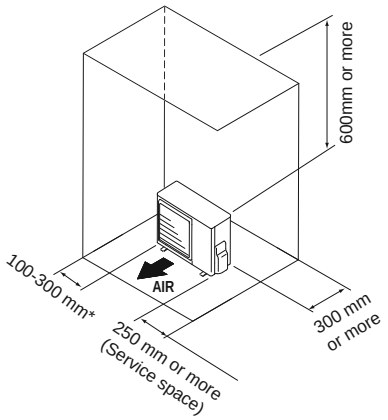
- When there are obstacles at the back side.



- When there are obstacles at the back and front sides.

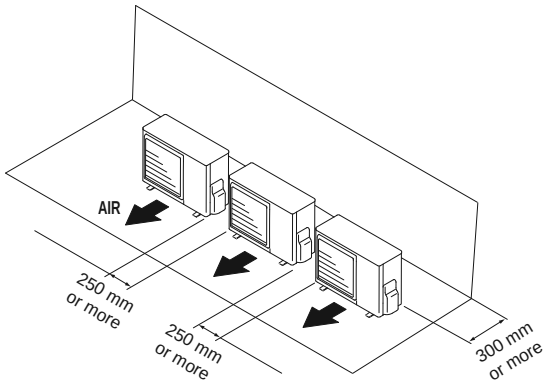


- When there are obstacles at the back, side(s), and top.

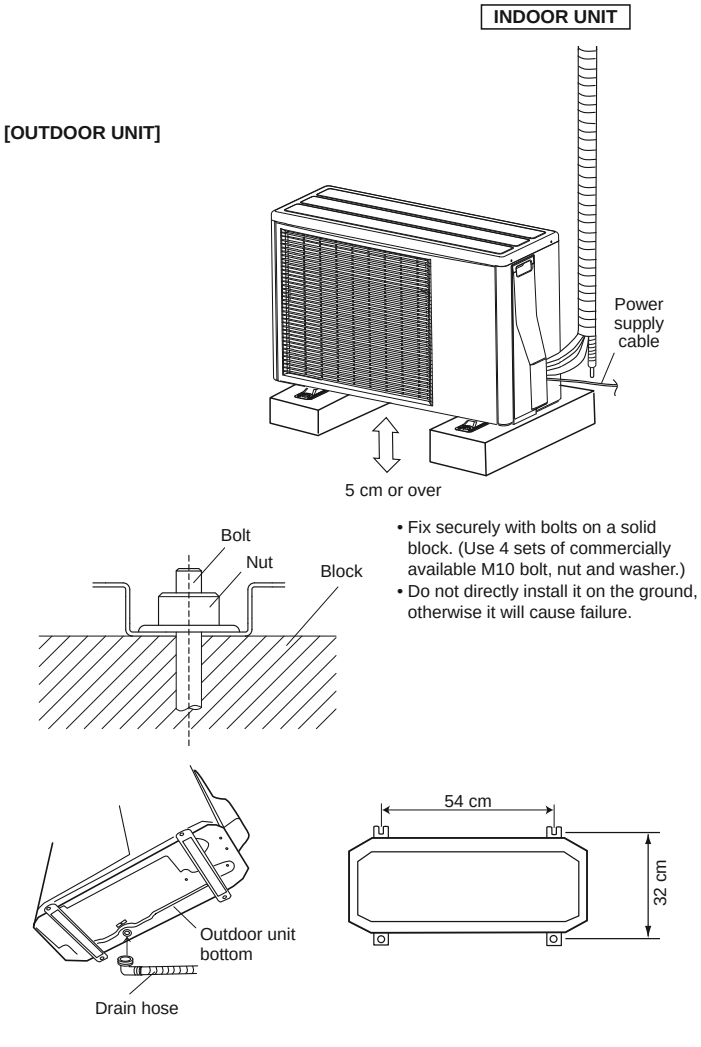


* If the space is larger than that is stated, the condition will be the same as that there are no obstacles.

- When there are obstacles at the back side with the installation of more than one unit.



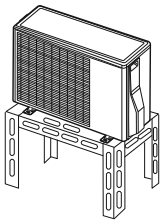
4. INSTALLATION DIAGRAM



⚠ CAUTION

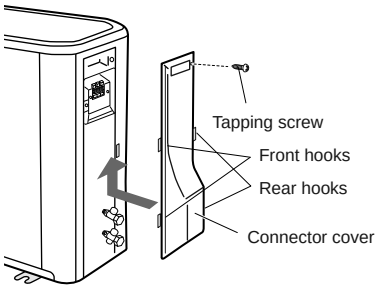
When the outdoor temperature is 0 °C or less, do not use the accessory drain pipe and drain cap. If the drain pipe and drain cap are used, the drain water in the pipe may freeze in extreme cold weather. (Reverse cycle model only)

In the area with heavy snowfall, if the intake and outlet of outdoor units blocked with snow, it might become difficult to get warm and it is likely to cause of the breakdown. Please construct a canopy and a pedestal or place the unit on a high stand (local configured).



5. INSTALLATION

5.1. Outdoor unit installation



Connector cover removal

• Remove the tapping screw.

Installing the connector cover

(1) After inserting the four hooks, then slide the cover.
(2) Tighten the tapping screw.

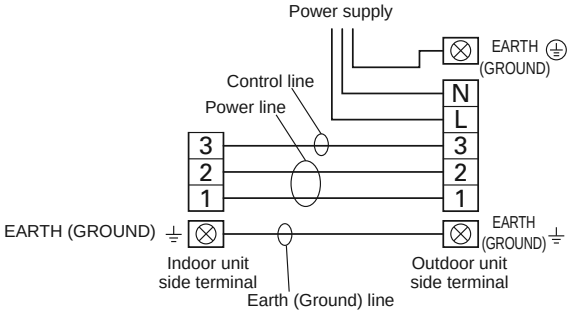
⚠ WARNING

Install the unit where it will not be tilted by more than 5°.

When installing the outdoor unit where it may exposed to strong wind, fasten it securely.

5.2. Outdoor unit wiring

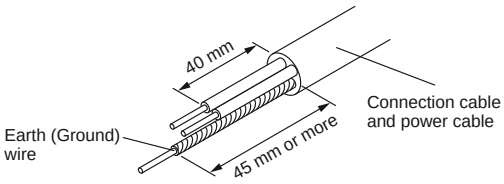
1. CONNECTION DIAGRAMS



2. CABLE PREPARATION

• When stripping off the coating of a lead wire, always use a special tool such as a wire stripper. If there is no special tool available, carefully strip the coating with a knife etc.

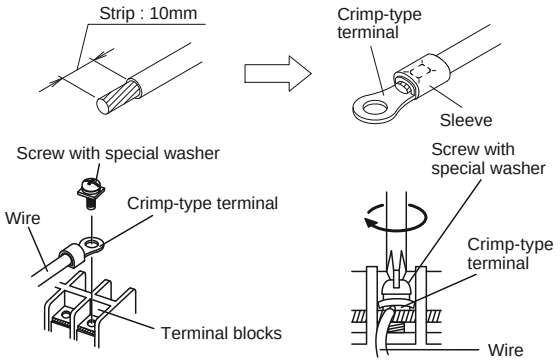
Keep the earth (ground) wire longer than the other wires.



How to connect wiring to the terminal

Caution when wiring cable

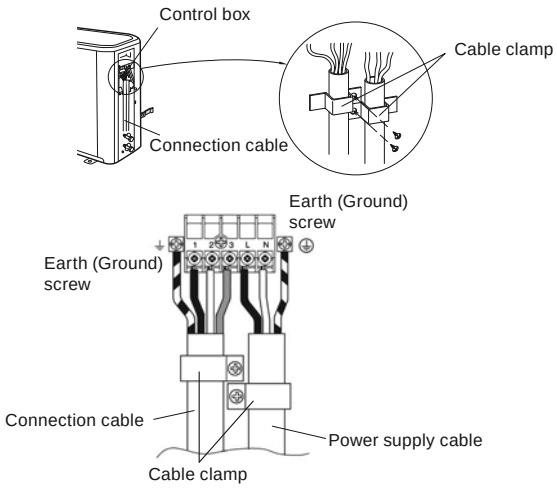
(1) **Use crimp-type terminals with insulating sleeves as shown in the figure to connect to the terminal block.**
(2) **Securely clamp the crimp-type terminals to the wires using an appropriate tool so that the wires do not come loose.**
(3) **Use the specified wires, connect them securely, and fasten them so that there is no stress placed on the terminals.**
(4) **Use an appropriate screwdriver to tighten the terminal screws. Do not use a screwdriver that is too small, otherwise, the screw heads may be damaged and prevent the screws from being properly tightened.**
(5) **Do not tighten the terminal screws too much, otherwise, the screws may break.**
(6) **See the table below for the terminal screw tightening torques.**



Tightening torque [N·m (kgf·cm)]	
M4 screw	1.2 to 1.8 (12 to 18)

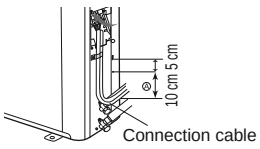
3. OUTDOOR UNIT

(1) Remove the outdoor unit connector cover.
(2) Bend the end of the cable as shown in the figure.
(3) Connect the end of the connection cable fully into the terminal block.
(4) Fasten the sheath with a cable clamp.
(5) Install the connector cover.



Connection cable wiring

Run the connection cable to the rear of the outdoor unit within the Ⓐ range of the arrows shown in the figure.
(The connector cover becomes difficult to install.)



⚠ CAUTION

Before starting work, check that power is not being supplied to the indoor unit and outdoor unit.

Match the terminal block numbers and connection cable colors with those of the indoor unit.
Erroneous wiring may cause burning of the electric parts.

Connect the connection cable firmly to the terminal block. Imperfect installation may cause a fire.

Always fasten the outside covering of the connection cable with the cord clamp. (If the insulator is chafed, electric leakage may occur.)

Securely earth (ground) the power cable.

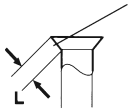
Do not use the earth (ground) screw for an external connector. Only use for interconnection between two units.

5.3. Connecting the piping

BENDING PIPES

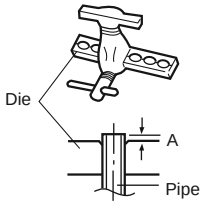
(1) When bending the pipe, be careful not to crush it.
(2) To prevent breaking of the pipe, avoid sharp bends.
Bend the pipe with a radius of curvature of 150 mm or over.
(3) If the copper pipe is bend the pipe or pulled to often, it will become stiff. Do not bend the pipes more than three times at one place.

Check if [L] is flared uniformly and is not cracked or scratched.



FLARING

(1) Cut the connection pipe to the necessary length with a pipe cutter.
(2) Hold the pipe downward so that cuttings will not enter the pipe and remove the burrs.
(3) Insert the flare nut onto the pipe and flare the pipe with a flaring tool.



Insert the flare nut (always use the flare nut attached to the indoor and outdoor units respectively) onto the pipe and perform the flare processing with a flare tool.
Use the special R410A flare tool, or the conventional (for R22) flare tool.
When using the conventional flare tool, always use an allowance adjustment gauge and secure the A dimension shown in Table 2.

CONNECTION

(1) Install the outdoor unit wall cap (supplied with the optional installation set or procured at the site) to the wall pipe.
(2) Connect the outdoor unit and indoor unit piping.
(3) After matching the center of the flare surface and tightening the nut hand tight, tighten the nut to the specified tightening torque with a torque wrench. (Table 1)

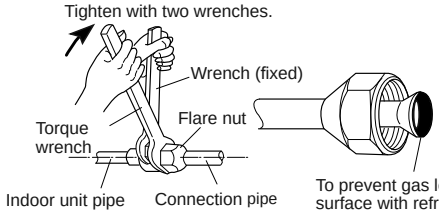


Table 1 Flare nut size and tightening torque

Flare nut [mm (in.)]	Tightening torque [N•m (kgf•cm)]
6.35 (1/4) dia.	16 to 18 (160 to 180)
9.52 (3/8) dia.	32 to 42 (320 to 420)
12.70 (1/2) dia.	49 to 61 (490 to 610)
15.88 (5/8) dia.	63 to 75 (630 to 750)
19.05 (3/4) dia.	90 to 110 (900 to 1100)

Table 2 Pipe outside diameter

Pipe outside diameter [mm (in.)]	Dimension A [mm]
	Flare tool for R410A, clutch type
6.35 (1/4)	0 to 0.5
9.52 (3/8)	
12.70 (1/2)	
15.88 (5/8)	
19.05 (3/4)	

⚠ CAUTION

Fasten a flare nut with a torque wrench as instructed in this manual. If fastened too tight, the flare nut may be broken after a long period of time and cause a leakage of refrigerant.

During installation, make sure that the refrigerant pipe is attached firmly before you run the compressor. Do not operate the compressor under the condition of refrigerant piping not attached properly with 2-way or 3-way valve open. This may cause abnormal pressure in the refrigeration cycle that leads to breakage and even injury.

5.4. Air purge

Always use a vacuum pump to purge the air.
Refrigerant for purging the air is not charged in the outdoor unit at the factory.

Close the high pressure side valve of the gauge manifold fully and do not operate it during the following work.

⚠ CAUTION

Refrigerant must not be discharged into atmosphere.

After connecting the piping, check the joints for gas leakage with gas leak detector.

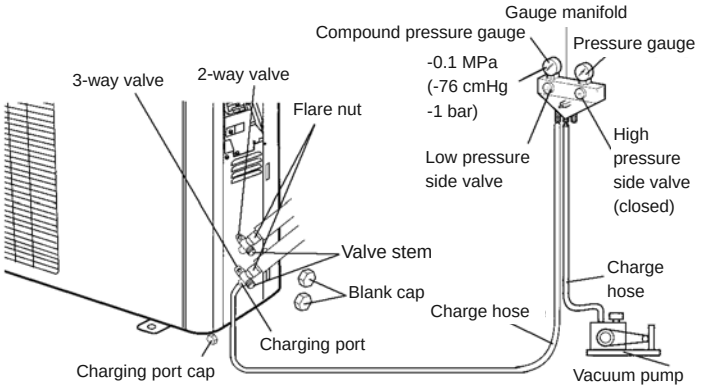
Gas leak checks are performed using either vacuum or nitrogen gas, so select the proper one depending on the situation.

Checking gas leaks with vacuum:

(1) Check if the piping connections are secure.
(2) Remove the cap of 3-way valve, and connect the gauge manifold charge hoses to the charging port of the 3-way valve.
(3) Open the valve of the gauge manifold fully.
(4) Operate the vacuum pump and start pump down.
(5) Check that the compound pressure gauge reads -0.1 MPa (76 cmHg), operate the vacuum pump for at least 1 hour.
(6) At the end of pump down, close the valve of the gauge manifold fully and stop the vacuum pump.
(It checks that leave as it is for about 10 minutes, and a needle does not return.)
(7) Disconnect the charge hose from the 3-way valve charging port.
(8) Remove the blank caps, and fully open the spindles of the 2-way and 3-way valves with a hexagon wrench.
[torque: 6 to 7 N·m (60 to 70 kgf·cm)].
(9) Tighten the blank caps and charging port cap of the 2-way valve and 3-way valve to the specified torque.

Checking gas leaks with nitrogen gas:

(1) Check if the piping connections are secure.
(2) Remove the cap of 3-way valve, and connect the gauge manifold charge hoses to the charging port of the 3-way valve.
(3) Pressurize with nitrogen gas using the 3-way valve charging port.
(4) Do not pressurize up to the specified pressure all at once but do so gradually.
① Increase the pressure up to 0.5 MPa (5 kgf/cm^2), let it sit for about five minutes and then check for any decrease in pressure.
② Increase the pressure up to 1.5 MPa (15 kgf/cm^2), let it sit for about five minutes and then check for any decrease in pressure.
③ Increase the pressure up to the specified pressure (the pressure designed for the product) and then make a note of it.
(5) Let it sit at the specified pressure and if there is no decrease in pressure then it is satisfactory. If a pressure decrease is confirmed, there is a leak, so it is necessary to specify the leak location and make minor adjustments.
(6) Discharge the nitrogen gas and starting removing the gas with a vacuum pump.
(7) Open the valve of the gauge manifold fully.
(8) Operate the vacuum pump and start pump down.
(9) Check that the compound pressure gauge reads -0.1 MPa (76 cmHg), operate the vacuum pump for at least 1 hour.
(10) At the end of pump down, close the valve of the gauge manifold fully and stop the vacuum pump.
(11) Disconnect the charge hose from the 3-way valve charging port.
(12) Remove the blank caps, and fully open the spindles of the 2-way and 3-way valves with a hexagon wrench.
[torque: 6 to 7 N·m (60 to 70 kgf·cm)].
(13) Tighten the blank caps and charging port cap of the 2-way valve and 3-way valve to the specified torque.



		Tightening torque
Blank cap	6.35 mm (1/4 in)	20 to 25 N·m (200 to 250 kgf·cm)
	9.52 mm (3/8 in.)	20 to 25 N·m (200 to 250 kgf·cm)
	12.70 mm (1/2 in.)	28 to 32 N·m (280 to 320 kgf·cm)
	15.88 mm (5/8 in.)	30 to 35 N·m (300 to 350 kgf·cm)
	19.05 mm (3/4 in.)	35 to 40 N·m (350 to 400 kgf·cm)
Charging port cap		12.5 to 16 N·m (125 to 160 kgf·cm)

5.5. Test run

1. Make a TEST RUN in accordance with installation instruction sheet for the indoor unit.

CHECK ITEMS

INDOOR UNIT

(1) Is operation of each button on the remote control unit normal?
(2) Does each lamp light normally?
(3) Do the air flow-direction louver operate normally?
(4) Is the drain normal?
(5) Is there any abnormal noise and vibration during operation?

OUTDOOR UNIT

(1) Is there any abnormal noise and vibration during operation?
(2) Will noise, wind, or drain water from the unit disturb the neighbors?
(3) Is there any gas leakage?

- Do not operate the air conditioner in the test running state for a long time.
- For the operation method, refer to the operating manual and perform operation check.

6. PUMP DOWN

6.1. Pump down

PUMP DOWN OPERATION (FORCED COOLING OPERATION)

To avoid discharging refrigerant into the atmosphere at the time of relocation or disposal, recover refrigerant by doing the cooling operation or forced cooling operation according to the following procedure. (When the cooling operation cannot start in winter, and so on, start the forced cooling operation.).

(1) Do the air purging of the charge hose by connecting the charging hose of gauge manifold to the charging port of 3 way valve and opening the low-pressure valve slightly.
(2) Close the valve stem of 2 way valve completely.
(3) Start the cooling operation or following forced cooling operation. Keep on pressing the MANUAL AUTO button of the indoor unit for more than 10 seconds. The operation indicator lamp and timer indicator lamp will begin to flash simultaneously during test run. (The forced cooling operation cannot start if the MANUAL AUTO button is not kept on pressing for more than 10 seconds.)
(4) Close the valve stem of 3 way valve when the reading on the compound pressure gage becomes 0.05~0 Mpa (0.5~0 kg/cm^2).
(5) Stop the operation.
    • Press the START/STOP button of the remote control unit to stop the operation.
    • Press the MANUAL AUTO button when stopping the operation from indoor unit side. (It is not necessary to press on keeping for more than 10 seconds.)

⚠ CAUTION

During the pump-down operation, make sure that the compressor is turned off before you remove the refrigerant piping.
Do not remove the connection pipe while the compressor is in operation with 2 way or 3 way valve open. This may cause abnormal pressure in the refrigeration cycle that leads to rupture and even injury.